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COMPUTERWORLD
HE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
y Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices ©1978 by CW Communications/Inc.
September 25, 1978 $1.00 a copy; $25/year

NEWSPAPER

Dollars and Sense

Users Propelled To Used Systems

By Ann Dooley
CW Staff

Substantial cost savings and equipment availability are the primary reasons that motivate small and mid-sized DP users to venture into the used computer market, either through leasing, third-party contracts or purchase arrangements, according to a sampling of preowned equipment users.

CW Special Report on Stretching the DP Dollar follows Page 62.

Generally well satisfied with their equipment and with their contract arrangements, several users interviewed claim to receive better service and significantly faster turnaround time in

(Continued on Page 4)

Itel Does the Same

IBM Brings Out AP Version of 3031

By Don Leavitt
CW Staff

WHITE PLAINS, N.Y. — IBM last week announced the 3041, an attached processor (AP) for its 3031 CPU that it said will give users internal performance gains "generally in the range of 1.6 to 1.8 times that of a single 3031."

(Itel Corp., in an announcement received as *Computerworld* went to press last week, introduced an AP version of its 3031-compatible Advanced System/5 [AS/5]. The AS/5 7031 AP system is 1.5 to 1.8 times more powerful than Itel's version of the uniprocessor 3031, the AS/5-3, 'which itself is rated equal to or greater than' the 3031, Itel claimed [see story on Page 5].)

At IBM, a spokesman explained its performance gains reflect the higher instruction processing rate made possible by the presence of a second processor, even though the AP configuration entails no change in the memory size or I/O channel operations of the 3031.

Unlike the multiprocessor (MP) version of the 3033, which reportedly offers the same degree of improvement for its users but costs more than two independent 3033s [CW, April 3], the 3031 AP appears to give the user good price/performance. A 2M-byte 3031 AP complex rents for approximately 50% more than a single 3031, the 6M-byte AP configuration is only 29% higher than the single 3031.

Current users of 3031 uniprocessors can upgrade to the AP environment; the additional cost — about half the cost of a 2M-byte 3031 — is the same no matter what the size of the original 3031.

The 3041, like the 3031, has a 115 nsec instruction processor cycle time and a 32K-byte high-speed cache memory. While the 3031 controls main memory and I/O functions, the 3041 contains functions for instruction execution and buffer control.

The AP complex shown here includes a 3031, 3041 AP, dual-display console and power units.

The mix of control responsibilities enhances the entire system's ability to handle machine-language instructions, reducing the effective data storage access time and speeding processing, IBM said.

The 3041 shares the 3036 console — with dual CRTs — with the 3031 for both operational and maintenance functions. Because the two processors are separately powered, maintenance in most cases can be performed on the 3041 while the 3031 continues to process the user's workload, albeit at a reduced rate, the spokesman noted. The reverse, of course, is not true.

The performance comparisons of the 3031 and the 3031 AP were based on matching workloads on identically configured systems — except for the 3041 — using OS/VS2 Release 3.7, the spokesman explained.

Although some users might envision attaching several 3041s to a 3031 in hopes of multiplying the processing

(Continued on Page 4)

STC Offers CCD Storage

Solid-State 2305-Type Unit a 'First'

By Howard A. Karten
CW Staff

NEW YORK — Storage Technology Corp. (STC) last week became the first to offer a solid-state version of the IBM 2305 drum storage unit.

The STC 4305 solid-state disk, said to be totally hardware- and software-compatible with IBM CPUs, in no way resembles a disk. It is a cabinet full of charge-coupled devices (CCD) intended primarily for paging and other high-usage applications, particularly within IBM's VM and MVS operating systems.

The 4305 is capable of accessing data in an average of .7 msec, one-seventh the time required by the IBM 2305, STC said. Its maximum access time is 1.4 msec compared with a maximum 10.4 msec on the IBM equivalent, a spokesman added.

Prices uf the 4305 range from $150,000 for a configuration with one controller and 11.2M bytes of storage to $400,000 for a system with dual controllers and 45M bytes of storage. These prices are 64% and 52%, respectively, of the equivalent IBM configurations, STC noted.

The spokesman for the Louisville, Colo.-based company said the current state of the art and the economic situation in the semiconductor industry made the device possible at this time. He predicted the rapidly advancing state of the art will make fixed-head disks noncompetitive in the 1980s.

In introducing the unit at a press conference here, company officials said the 4305 sets the stage for future product announcements by STC, but declined to elaborate.

The unit features electronic switching that includes dual channels, dual ports and variable data transfer rates of 1M- and 1.5M byte/sec, the spokesman said. An optional transfer rate of 3M byte/sec is available.

The feature permits the attachment of up to four different CPUs operating at different speeds to the same storage unit. Switching among the three data rates can be accomplished within one clock cycle under microcode control, the spokesman added.

STC expects to find the device used in applications requiring high data transfer rates, such as indexes, matrices, overlays, catalogs and work areas.

However, because the device is fabricated from CCDs rather than the oxide-based materials used in disks and other magnetic media, the STC unit is volatile — that is, it maintains data only so long as power is applied.

(Continued on Page 6)

'Bubble Brains' for Micros

Special to CW

LOS ANGELES — "Bubble memories can enable microcomputers to realize their full potential, especially in distributed computing," according to Gayle D. Lampson of Texas Instruments, Inc.

With the use of bubble and other new technologies, the micro may be able to accomplish "much of the same market expansion as the mini did . . . without the need for significantly increasing its capacity and/or performance," he told a Western Electronic Show and Convention (Wescon) session here recently.

Specifically, the bubble could enable the micro to be the low-cost alternative to the mini despite the micro's inherent constraints such as limited memory size, relatively low processing power and limit on the use of high-speed mass memory because of the bus structure, he told a session entitled "The Impact of New Memory Technologies on Computer Design.

Bubbles have potential in several areas. They can be a cost-effective alternative between random-access memory (RAM) and disk and a hierarchical memory system. However, they can also be linked with a microprocessor to form a "functional building block that is essen-

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$1.00 a copy. U.S.— $25 a year; Canada, Central & So. America — $35 a year; Europe and Near East — $75 a year; other foreign — $125 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

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Decision Nullified License

SBS to File for Court Rehearing

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Satellite Business Systems (SBS) will join the Federal Communications Commission (FCC) in petitioning for a rehearing of the recent appeals court decision that rescinded SBS' authorization to provide domestic satellite communications services.

The court told the FCC it had to consider the antitrust implications of SBS, a joint venture composed of IBM, Communications Satellite Corp. (Comsat) and Aetna Casualty & Surety Co. [CW, Sept. 11].

In motions to be filed within the next few weeks, FCC and SBS will ask for a hearing en banc — by all nine judges — of the U.S. Court of Appeals for the District of Columbia, SBS said. A three-judge panel of that court handed down the Aug. 29 ruling reversing and remanding SBS' authorizations by the FCC.

An SBS spokesman said the company hopes a rehearing en banc will reverse the original appeals court decision, which requires the FCC to hold antitrust hearings before approving or disapproving the company's license application.

SBS will also ask the court to approve continued project development pending resolution of the antitrust matter, the spokesman continued. If the appeals court rehearing is denied, the company could still continue system implementation activities while the FCC antitrust hearings took place.

While the matter is still before the appeals court, SBS may continue to let contracts for its system. However, if the court refuses a rehearing and if the U.S. Supreme Court, the next and final avenue of appeal, refuses to hear the case, SBS will have to suspend system development.

The FCC could, in that event, grant SBS an order allowing the company to continue until the commission's hearings ended, an FCC spokesman said.

Evidentiary hearings on the anticompetitive questions raised by the SBS application for a license could run as long as two or three years, according to some estimates. The company has already spent more than $86 million on the satellite project; its cost by 1986 is estimated to total about $406.9 million.

Justice Objected

The FCC, ruling the proposed integrated digital and voice communications system was not anticompetitive, granted SBS a license in January 1977. The Justice Department disagreed and took the matter to court.

Suits to stop the SBS authorization were also filed by Western Union Telegraph Co., American Satellite Corp. and Fairchild Industries; several of those suits were consolidated before the court handed down its decision.

The court agreed with the plaintiff that the FCC was required by law to hold hearings before deciding on the anticompetitive effects of the SBS system; under Section 2 of the Clayton Antitrust Act, the FCC is charged with antitrust enforcement in the communications industry.

In reaching its decision, the court rejected FCC reasoning that the domestic satellite industry is too new and experimental for a hearing that could produce any useful evidence about domestic satellite operations and economics.

Following the court's decision, the FCC voted 7-1 to petition the court for a rehearing. The FCC Office of General Counsel has asked the court for more time to file its request for a rehearing.

If the extension is granted, the commission will have until Oct. 13 to file its motion. Such an extension would most likely be granted to SBS as well, according to an FCC attorney.

The appeals court usually answers petitions for rehearing within 60 days, the attorney said, adding that most such appeals are denied.

In considering the FCC and SBS petitions for a rehearing, the court might ask the original plaintiff to reply to the rehearing motions. In that case, the matter would take considerably longer.

The FCC Office of General Counsel is not yet willing to speculate on the outcome of its petition. One staff member remarked that the case is "pretty routine up to this point."

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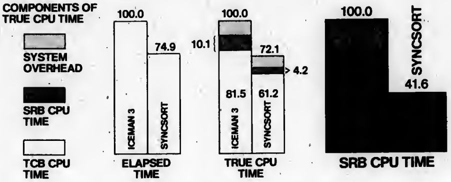

Incidentally, those charts on the right are particularly worth noting. They show the considerable difference in "locked-up" SRB Time between their sort and ours.

As you probably know, SRB Time is that component of True CPU Time when no messages can get through to the CPU. The more SRB Time in a sort, the greater the evil impact on other, non-sorting jobs in the mix.

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IBM Announces AP Version of 3031 Processor

(Continued from Page 1)

improvements, IBM said the only possible arrangement is "one-to-one: one 3031 and one 3041."

Operating system support for the 3031 AP complex is provided by the Virtual Machine Facility/370 (VM/370) as well as by OS/MVS — the current releases of OS/VS2. The AP system is also supported by IBM's MVS/System Extensions (MVS/SE) package, which uses the System/370 Extended Facility, a standard feature on both the 3031 and the 3041.

MVS/SE offers increased performance through enhancements to many system control functions, a spokesman asserted. Tests indicate the improvements may include reduction of control program supervisor state execution time and additional multiprocessing providing greater throughput potential in AP and MP installations, according to an IBM manual.

Virtual Machine Assist (MVA) and OS/VS1 Extended Control Program Support (ECPS), also are available to improve system performance when using VM/370 of the 3031 AP complex, IBM added.

Prices, Shipment Dates

First customer shipments of the 3031 AP complex, as well as field upgrades of installed 3031s, are scheduled to begin in the third quarter of 1979, the same timeframe as quoted for the 3033 MP.

Monthly rentals for an AP complex — consisting of a 3031 processor, a 3041 AP unit, a 3036 console with dual displays and two 3017 power units — will range from $41,239 with a 2M-byte main memory to $56,949 with 6M bytes.

Lease prices will range from $37,500 to $51,810/mo while purchased systems will cost from $1,375,000 to $1,830,000.

Current 3031 users can upgrade to an AP complex for an additional monthly rental of $13,742, a lease price of $12,500 or a purchase price of $375,000, regardless of the existing 3031's main memory size.

A functioning 3031 uniprocessor configuration — not just the barebones processor — rents for $27,497/mo with 2M bytes, for $35,097 with 4M bytes and for $44,207 with a maximum 6M bytes of main memory.

Lease cost of a 2M-byte 3031 system is approximately $25,000/mo while the purchase involves $1 million.

Users Like Used Equipment's Savings

(Continued from Page 1)

obtaining equipment through a computer dealer than by contracting with the major vendors, such as IBM. In addition, none of the users had experienced any problems with maintainability or upgrades.

One user, Banks of Iowa Computer Services, Inc. of Cedar Rapids, Iowa, which provides DP services to more than 125 commercial banks, said it reduced annual equipment costs by 15% to 30% since entering into a third-party leasing arrangement.

"All of our central and remote computer equipment is third-party equipment, previously leased from [IBM]. About three years ago, we purchased the equipment, then sold it to our used market dealer and arranged to lease it back," William McCormick, executive vice-president, explained.

The leasing arrangement has been financially advantageous both in monthly payments and as a hedge against inflation, McCormick said. Equipment lease prices offered by the major manufacturers keep rising, but a fixed-term contract stabilizes those costs over time, he noted.

A third-party arrangement ensures more flexibility; it takes 60 to 90 days to get equipment for a dealer compared with IBM's delivery schedule, which requires users to anticipate their needs 12 to 18 months in advance.

In addition to the financial considerations, McCormick said, it is more comfortable to rely on a third-party lessor to perform any remarketing that becomes necessary than to sell the equipment on one's own.

Banks of Iowa, which handles the financial accounting procedures of its member banks, leases an IBM 370/158 linked by leased telecommunications lines to three small data capture centers in Des Moines, Sioux City and Waterloo. Each center is equipped with an IBM System/3, including several Model 1419 reader/sorters and Model 1403-N1 printers. Similar equipment is used with the 370/158. The System/3s collect the financial information and transmit it to the CPU at the main site, where it is processed and networked to the remote sites.

$1 Million Savings

Chicago Rawhide Manufacturing Co., which is leasing its equipment from a third party instead of the manufacturer, IBM, also is realizing savings of $147,576 a year — or $1,109,918 over the equipment's leasing life. The Elgin Ill.-based firm, which produces sealant devices, has leased a variety of equipment from the used computer market for its manufacturing plant applications.

> *'I estimate we save in excess of 25%. The pricing has always been better in the used computer market, and we've always been satisfied with equipment from it.'*

The leased equipment — some of which is new and some of which is used — includes an IBM 370/145, 634/20 Model 5 tape drives and controller, a card reader/punch, 384K of memory and a Model 3211 printer. "We're saving $2,000 a month just by leasing the CPU alone, according to Dean Belin, DP manager.

In addition to the financial advantages, the big plus with the used computer market is the availability of equipment, he said.

Savings in Bloom

Another third-party leasing arrangement is saving nearly $10,000 a year for Bachman's, Inc. of Minneapolis, a large independent florist and nursery. Bachman's is so pleased with the arrangement that it is planning to upgrade its leased system shortly, according to Thomas Jennings, DP manager.

Currently using non-IBM plug-compatible peripherals on a System/3 Model 10 obtained through a third-party ownership arrangement, the company plans to change to a used Model 15. The lease arrangements will result in savings of approximately $1,200/mo over comparable IBM terms and equipment. It will also enable the user to upgrade a Memorex Corp. printer capability and additional disks, Jennings said.

The arrangement is beneficial because "we're getting the extras IBM couldn't manufacture, such as fast printers and disk drives," Jennings said. Once the Model 15 arrives, the florist's system will include 128K of memory, 2M bytes of on-line disk storage, IBM 3340 disk drives, a non-IBM printer, an IBM 029 keypunch, a two-station Model 3742 diskette machine and three 3741 transmitting stations.

Bachman's has achieved better results in getting problems resolved through the third-party dealer than through IBM, Jennings said. The only disadvantage to leasing equipment is that it is impossible to take advantage of the tax breaks offered to those who purchase the equipment, he noted.

Affordable Alternative

Given the going rate for comparable new equipment, Paul Rossan, senior vice-president of the First National Bank of Kansas City, Mo., said his company could probably not afford anything but used equipment via third-party arrangements.

"I estimate we save in excess of 25%. The pricing has always been better in the used computer market, and we've always been satisfied with equipment from it;" Rossan said.

Participating in a third-party arrangement since 1973, the bank leased equipment including two 2M-byte IBM 370/158 multiprocessor systems and some tape drives.

In addition to the price advantage, "we've also obtained better delivery from the used market than from original equipment manufacturers, so we receive equipment when we need it without delays," Rossan said.

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Maximum Memory Larger than IBM's

Itel 3031-Compatible AS/5 Gains AP Model

By Howard A. Karten
CW Staff

SAN FRANCISCO — Itel Corp. last week announced an attached processor (AP) version of its Advanced System/5 Model 3 (AS/5-3) 7031 system, which is offered to users as an alternative to the IBM 3031.

The move keeps Itel in step with IBM — and even a bit ahead, since deliveries of its $470,000 system are promised for the second quarter of 1979, a full quarter ahead of IBM's initial delivery of the 3041 AP (see story on Page 1).

Itel's $1.57 million price tag buys a complete AP configuration with 2M bytes of memory. This compares with IBM's price for the same configuration, which is $1.37 million.

16M-Byte Memory

In addition, Itel claimed the ability to attach a maximum of 16M bytes of memory to the AP configuration, compared with IBM's stated maximum of 6M bytes.

Itel declined to provide typical lease figures for the AP system, saying that the variation in equipment, lease terms and other factors make it impossible to provide meaningful figures.

A typical 2M-byte AS/5-3 7031 system sells for $1.1 million. By adding the AP and associated memory, a user can obtain 50% to 80% greater throughput for an additional expenditure ranging upwards from 43%, Itel asserted.

Itel claimed its AP provides 1.5 to 1.6 times more throughput than its uniprocessor system, based on tests conducted by the company. In addition, the processor cycle time, 100 nsec, is 14% faster than the cycle time announced by IBM for its AP.

Other highlights of the Itel system include an expanded reloadable control storage, the ability to add up to 8M additional bytes of monolithic main memory in 1M-byte increments (for a maximum memory size of 16M bytes), a 32K-byte high-speed buffer memory and a 128-entry translation lookaside buffer.

IBM software is fully compatible with the Itel AP, a spokeswoman said.

She also noted that Itel believes its AP system is directly equivalent to the 3041 AP announced by IBM and offers performance equal to or better than that system.

Additions Boost Power of VAX

By Howard A. Karten
CW Staff

MAYNARD, Mass. — Digital Equipment Corp. has made several enhancements to its VAX-11/780 aimed at advancing the system's real-time performance.

The enhancements include a fourfold increase in memory size to a maximum of 8M bytes, support of two real-time, direct memory access (DMA) interfaces, the addition of an interface to the company's previously introduced TE45 tape drive and a high-level systems implementation language.

The language is used for development of languages, compilers and other software products; it is not intended for use in developing application programs, a spokesman noted.

The memory, available in increments of 256K, 512K and 1M bytes, is contained on 16K-bit error-correction code (ECC) MOS chips. The ECC MOS technology provides automatic hardware checking within memory, according to the spokesman, who added that the increased memory size permits execution of large programs without paging or swapping and substantially extends the number of simultaneous users beyond the present maximum of 63.

Memory for the 32-bit system is priced at $13,000 for 256K bytes, $22,000 for 512K bytes and $35,000 for 1M byte. First deliveries are set to begin next month.

The two DMA interfaces, LPA11-K and the DR11-B, are microprocessor-controlled. The former has an aggregate data transfer rate in excess of 100,000 sample/sec, DEC said, while the DR11-B is a 16-bit parallel interface for real-time applications requiring higher data rates.

A user's manual covers development of operating system software for the DR11-B and for custom real-time devices such as graphic displays, process I/O and analog-to-digital or digital-to-analog converters. "How to Write an I/O Driver" also shows how to build special device drivers that can be loaded dynamically, avoiding changes in the operating system.

The LPA11-K, priced at $4,985, is scheduled for initial deliveries in January; the $1,620 DR11-B is currently being delivered.

The Bliss-32 language, scheduled for January availability, carries a single-system license fee of $12,000; the enhanced tape drive, a 75 in./sec, 800- or 1,600 bit/in. unit, is available for $23,000.

Dr. John Mucci, DEC's laboratory data products marketing manager, said the offerings are of particular significance to scientific users and to both end users and OEMs who want to interface a wide variety of devices.

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Our need is ☐ immediate ☐ 3-6 months ☐ over 6 months

STC Introduces 2305-Type Unit Featuring CCDs

(Continued from Page 1)

The company, therefore, recommends its use with uninterruptible power supplies or in read-only applications.

First shipments of the device are expected to begin in January, according to Gary Holtwick, STC's manager of systems and product support, who added that "with demand for IBM's 2305 higher than ever, [STC] has just about sold out the entire year's production" of the 4305. The spokesman estimated that this represented approximately $37 million in business for the nine-year-old company.

Physically, the unit is said to require only 40% of the power used by the IBM 2305 and, with a maximum configuration (two controllers and four storage modules) takes only 20% of the space occupied by that unit. Air-conditioning requirements are also said to be significantly lower.

Service can be performed at the chip, card or module level, STC said; the only moving part in the device is a blower fan used for cooling.

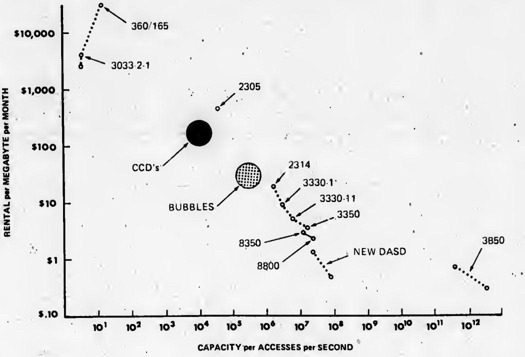
The unit also contains built-in diagnostics that look at error-correction code circuits to ensure that the unit is operating properly; the diagnostics include read/write tests and microdiagnostics to permit on-line or in-line servicing, the firm noted.

In addition, the unit's capacity, which ranges from 11.2M to 45M bytes, is said to be field-upgradable.

The unit can sustain a 30 msec line voltage variation, making it less susceptible to power fluctuations than standard disk units, STC said.

A three-year lease for a 23M-byte 4305 with two controllers and two disks per controller, but without the 3M byte/sec channel rate, costs $6,045/mo, compared with an estimated price of $11,894/mo for the same amount of storage from IBM. STC is at 2270 S. 88th St., Louisville, Colo. 80027.

Trends in Online Storage - Future Product Directions

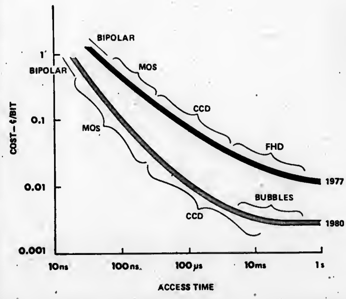


These charts were released by Storage Technology Corp. last week as it introduced its 4305, a CCD replacement for the IBM 2305 drum storage unit.

4305 Compared to 2305-2

	STC 4305	IBM 2305-2	IBM 3350 F.H.
BYTES PER TRACK (R1 NO KEY)	14,660	14,660	19,069
TRACKS PER DRUM (SPINDLE)	768	768	60
BYTES PER DRUM (SPINDLE) (R1 NO KEY)	11.2 MB	11.2 MB	1.1 MB
DRUM (SPINDLES) PER FACILITY	4	2	32
AVERAGE ACCESS-MILLISECONDS	0.7	5.0	8.4
MAXIMUM ACCESS-MILLISECONDS	1.4	10.2	16.8
TRANSFER RATE-MEGABYTES/S	3.0/1.5/1.0	1.5	1.2

Memory Cost versus Performance



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IBM User Witness Details 'Success' Criteria

By Marguerite Zientara
CW Staff

NEW YORK — An IBM user witness in the U.S. vs. IBM antitrust trial here last week described IBM as a "successful" DP equipment company because it meets his criteria for success in the areas of delivery, performance, service and support extremely well.

John L. Jones, vice-president of management information systems for Southern Railway Co., said his definition of "successful" demands that a vendor have a product that is responsive to the user's needs and deliverable on schedule. According to Jones, the product must perform according to its specifications and uniformly with other equiopment.

Under direct questioning by lead IBM attorney Thomas Barr, Jones stated the reliability of a successful DP company's products must be high "a high percentage of the time" — that is, close to 100%.

He said also a company must be able to service the user's equipment "promptly and effectively," with the work done by "qualified individuals."

In addition, Jones said a DP company must be able to support its own equipment.

He testified that at Southern Railway's (SR) central DP site in Atlanta, where four IBM 370/158s are in operation, IBM has met the above criteria "in every case" extremely well.

Data General OK, Too

Data General Corp., another supplier for the railroad, has also met Jones' criteria for success "at this point in time," he said. For process control functions, SR uses five Nova 1200s, linked together to operate as one, at the Sheffield, Ala., switching yard.

Jones further testified that for other railroads with similar needs, " it would seem that [Data General] equipment meets these criteria also."

However, Jones did have a horror story concerning Telex Corp. He testified that in 1972 he ordered two sets of 2314-equivalent disk drives for SR.

The week of scheduled delivery, Jones testified, a Telex representative called him and said Telex had "no intention of delivering" them.

Jones said he was so angry at the time that he did "more talking than listening," but that his impression of the reasons given were simply that the disk drives were not available and Telex did not expect to have them available. He consequently ordered Ampex Corp. disk drives.

IBM's fourth user witness, Jones seemed to have been called as much for his knowledge of and experience in the early days of computing as for his testimony as an IBM customer. Composed and well-spoken, he demonstrated an impressive grasp of both the railroad and computer industries.

Jones was one of the DP pioneers who helped develop the programming for the first computers used by the U.S. Air Force, and he cochaired the committee that developed the Cobol language standard.

His background in the early days of computing seems to have made Jones a dual-purpose witness for IBM — he can testify to both the technological and commercial development of the computer industry as well as to IBM's capabilities as a supplier.

HP Mini Users Offered Quartet Of Peripherals

By Ronald A. Frank
CW Staff

PALO ALTO, Calif. — As part of its program to provide its minicomputer users with "a full range" of peripheral products, Hewlett-Packard Co. has introduced a 400 line/min printer, a graphics printing terminal, an expanded communications teleprinter and a magnetic tape controller.

The 2608A 400 line/min dot matrix printer was described as one of the first to be built completely by a minicomputer vendor. The printer offers a variety of printing modes and can produce characters that are double the normal size 5 by 7 matrix. The standard character set is 128-character Ascii. The printer costs $9,250.

The 2631G graphics model of the serial impact printer produces hard copy on standard paper from any raster format display on an HP 2647 or 2648 graphics terminal. Resolution is 72 by 72 dot/in. The printer also accepts Ascii data and prints at 180 char./sec. Graphics print speed can reportedly be increased with a double buffering technique. The unit costs $4,250.

The 2936A is an improved version of the HP teleprinter that has a serial interface to handle varied communications protocols. Both EIA RS-232C and current loop options are available for speeds up to 9,600 bit/sec. The unit can be configured for various block data transfer sizes, and it will support Bell 103- and 202-type modems. It is priced at $4,025.

HP also introduced an interface controller compatible with IEEE standard 488-1975 digital magnetic tape drives. The controller resides in the tape drive rather than in the CPU as in earlier versions. The tape subsystem includes a low-boy design in addition to the interface. The HP 7970E option 426 magnetic tape subsystem with cabinet and interface controller costs $12,000.

All units are available within 12 weeks from HP at 1507 Page Mill Road, Palo Alto, Calif. 94304.

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Experiments Urged to Aid Standards Debates

By Don Leavitt
CW Staff

CUPERTINO, Calif. — All standardization work tends to be slow and careful, but Jef Raskin has some serious concerns about the way American National Standards (ANS) Comittee X3J2 is moving toward a standard for Basic.

A professor of computer science by background and currently acting director of application software for Apple Computer, Inc., Raskin admitted in a recent interview that although he has only attended one meeting of X3J2, he "certainly isn't mad" at the committee for the way it is doing things.

In general, Raskin's concern seems wrapped around the thought that this and all other ANS committees' work is based on "weighty and inviolate" opinions, whereas since the time of Galileo, people have recognized the value of the experimental method.

"Instead of trading opinions about how a situation should be handled, we should develop two systems, one of which handles the problem one way while the other uses the alternate approach. Run the things and see which is easier and which causes fewer errors," Raskin said.

What criteria should be used to judge the tests? The system developers could answer the "ease of construction" question, while the user — including the novice for whom Basic was originally intended — could evaluate the error problem, the Apple spokesman said.

Raskin also said he feels the standards group isn't recognizing the "real world" which already includes "tens of thousands of personal computer users working with Basic" and will grow to "hundreds of thousands" by the time the standard is finally developed and approved.

People working with the miniature systems are regularly utilizing capabilities far beyond those being seriously considered for the standard. Sound and graphic output, for example, "have been in the personal computer systems for a long time," he added as an example of the facilities being overlooked.

The general thrust of X3J2's work seems to be toward compilers, which typically are on larger systems, rather than toward the interpretive approach used by the personal computers. The committee's work on flow loop control, while "correct and admirable," is meaningless in systems that don't have object code in which a referenced variable is clearly identifiable, he said.

Raskin closed with a request that anyone interested in Basic or in the standards process in general submit a position paper to the X3 Secretariat at the Computer and Business Equipment Manufacturers Association, 1828 L St. N.W., Washington, D.C. 20036.

Alternately, he said he'd be glad to hear from anyone. Apple is at 10260 Bandley Drive, Cupertino, Calif. 95014.

Bubbles Seen for Micros

(Continued from Page 1)

tially an intelligent mass storage peripheral."

Such a device could provide 2M- to 12M bytes in the same area as a floppy drive, he explained.

File Management

But the real advantage is that a microcomputer system using an intelligent bubble storage peripheral could possibly provide file management functions for on-line systems more cost-effectively than those available from a minicomputer system, Lampson said.

He explained that such an intelligent peripheral could allow the CPU microcomputer to:

- Access a high-performance storage peripheral.
- Restrict itself to what it does best (process data and compute).
- Acquire the performance power of a capable file management facility without absorbing any of the attendant file organization and control overhead necessary with the mini.
- Increase its throughput performance without suffering a significant increase in working memory capacity.

This type of intelligent peripheral could greatly enhance the processing power of the micro, he stated.

"With an intelligent bubble memory peripheral-based microcomputer system, a per-site savings of perhaps $10,000 or more could be realized. Such a cost savings could escalate into an appreciable amount, particularly when a large distributed computing network of 50 or 100 more remote sites is planned. This could provide the necessary cost justification to reactivate the planning of networks that are currently shelved because of the high costs involved via a standard minicomputer approach," Lampson suggested.

Distributed Data Base

Another possibility for an intelligent bubble memory storage peripheral "is that it could offer a cost-effective approach for distributed data base applications," he continued.

The peripheral could serve as a "high-performance regional data base subsystem, front-ended by a small microcomputer to handle the communications line data requests from remote site computer systems," he said.

"By the judicious use of perhaps even a hierarchical distributed data base approach, the necessity for a large minicomputer disk-based system at each site could be pared down to a smaller, less costly, stand-alone, nondisk mini or microcomputer system," he stated.

"Through use of an intelligent bubble memory storage peripheral, a more cost-effective approach to distributed data base networks could be possible."

These are only two examples of how bubble technology can affect the design and application of microcomputer systems, he told Wescon attendees.

Whether used with mainframes, minis or micros, bubbles can improve both system cost and performance, he said. In many applications, they offer lower total system cost and higher system performance.

Chip capacities should increase greatly within the foreseeable future, he stated. "By the early to mid-1980s, chips with capacities of 500K- to 1.2M bytes and data transfer rates in the megabit/sec/chip range are well within the realm of possibility," Lampson said.

The key to evaluating costs of various types of storage is not so much in cost/bit comparisons but in total systems cost comparisons, he said.

For instance, a look at the operational characteristics of moving-head disks as opposed to bubbles reveals that bubbles will become system cost-competitive before attaining an equal cost/bit, he continued.

Specifically, overhead on a disk can consume 15% to 35% of a disk's surface depending on the number of sectors per track. But 1M byte of bubble can be 1M byte of useful storage, he claimed. In addition, the natural characteristics of bubble chips automatically provide 'useful segments.' "

Whereas disks continuously spin after initial positioning, the bubble's input and output files are always in the right position for each subsequent record, Lampson said.

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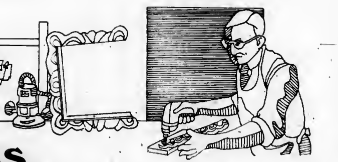

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One-Day Meet To Probe ACS, Plug Compatibles

NEW YORK — Two major issues of importance to DP users will be the subject of a one-day conference sponsored by Oppenheimer & Co. Inc. in three cities next month.

The Key Issues Conference will explore the impact of AT&T's Advanced Communications Service (ACS) and the impact of IBM's plug-compatible mainframe competition.

Designed to be of interest to both users and vendors, the session will feature both telecommunications and industry spokesmen DP who will analyze the ACS and plug-compatible areas.

The ACS portion of the meeting will include William Stritzler, marketing director, cross-industries, AT&T; Lawrence Roberts, chairman of the board of Telenet Communications Corp.; Terry Mahn, Washington, D.C., regulatory attorney; and William Slomin of the Federal Communications Commission's Common Carrier Bureau.

Plug-compatible issues will be discussed by David Morgenthaler, vice-president of business planning at Amdahl Corp.; Bert Hochfeld, vice-president at Telex Computer Products; and Gideon Gartner, vice-president at Oppenheimer & Co.

Included will be a "recap" of two studies performed specifically for the conference. The first is a survey of 50 large IBM users concerning their plans on Systems Network Architecture and how ACS will affect these plans. The second was described as a statistical profile of plug-compatible mainframe users.

The one-day conference will be held in New York at the Americana Hotel on Oct. 3; in Chicago at the Holiday Inn City Centre on Oct. 4; and in San Francisco at the Fairmont Hotel on Oct. 5.

Further details are available from Oppenheimer & Co., One New York Plaza, New York, N.Y. 10004.

Conference Set For Federal DP

WASHINGTON, D.C. — Federal government representatives and DP specialists as well as DP experts from the private sector will participate in more than 30 tutorial seminars, sessions and workshops at the Federal Computer Conference here Nov. 7-9.

The three-day conference, expected to be the largest of its kind ever held in the nation's capital, will feature more than 70 speakers including Richard M. Harden, special assistant to the President for information management, and Dr. Gene Amdahl, chairman of the board of Amdahl Corp.

The conference will also feature an exposition with more than 100 DP vendors.

Registration fees range from $75 to $235 for government employees and from $85 to $285 for private-sector individuals, depending on the type of sessions attended.

Further information can be obtained by writing to Federal Computer Conference, P.O. Box 368, Wayland, Mass. 01778.

Business Not as Usual

By E. Drake Lundell Jr.
CW Staff

BEIRUT, Lebanon — With all the problems of keeping a computer center operating during a civil war, one would think things would be simple when the war ran down.

But for Col. Joseph Wehbe and his crew here, who managed to keep their center live for 12 months as battles raged around them [CW, Sept. 18], many of their problems only started after the November 1976 cease fire.

"December of 1976 was our busiest month ever," Wehbe said — "much busier than December 1974, before the fighting.

The reason? Wehbe's installation was one of only three out of 22 that survived the conflict.

The other two — one in the Finance Ministry and one in the national electric company — were running 24 hours a day with their own problems.

The government therefore loaded all the other government work on Wehbe's IBM 370/135 — and in the process took the center out of the control of the army and appointed Wehbe as president for the newly created Interministerial Commission for Informatics, giving him all the work to catch up on.

To do this, the center had to undertake a massive conversion effort since many of the other centers before the war had been operating on non-IBM equipment. All programs had to be converted to the IBM environment, causing Wehbe's people to work 20 hours a day.

Besides the different equipment, the different variations of supposedly standard languages had to be taken into consideration, causing further delays.

In addition, many of the centers had produced their Arabic script in different ways, and all of these had to be converted to a common method.

Wehbe is now working on an overall computer plan for the country, and one major feature will be backup computer centers that are fully compatible — and possibly underground, he said.

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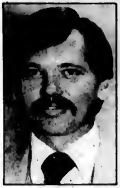

Price

Fluegel

Graves

Phillips

Porter

Brooks

The directors of Trust Co. of Georgia, an Atlanta-based statewide bank holding company, have promoted four members of the staff of Trusco Data Systems (TDS), the holding company's statewide DP organization.

PATRICIA R. GRAVES, TDS systems and programming, and EVERETT ELLIS PORTER, TDS administration, were both named assistant vice-presidents. Appointed operations officers were RICKY W. BROOKS, TDS operations, and MURRAY W. PHILLIPS, TDS automated bank services.

Graves joined the Trust Co. of Georgia staff in 1974 after working for the State of Georgia as a programmer. She holds a B.S. degree in mathematics from the University of Georgia.

Porter joined the Trust Co. staff as TDS controller after a position with Oxford Industries in Atlanta as a financial systems administrator. Porter holds a B.S. degree in industrial management from Georgia Tech.

Brooks has been employed by the Trust Co. since 1973 and holds a paramedic degree from Dekalb Tech.

Phillips, who has been employed by TDS as a bank service representative, was formerly employed by the First National Bank in Macon, an affiliate of Trust Co. He has a certificate in computer programming from the Macon Area Vocational Tech School.

• • •

RONALD C. PRICE has been named manager of DP operations for ITT Cannon Electric in Santa Ana, Calif.

Formerly data control manager with Nissan Motor Corp., Price has also held DP positions with Toyota and American Motors.

He attended Cerritos College in Norwalk, Calif. and served in the U.S. Army.

• • •

RICHARD FLUEGEL has been appointed vice-president for informations systems by Drew Chemical Corp. in Boonton, N.J.

Fluegel joined Drew in 1970 as a senior systems analyst, became manager in 1973 and then director of information systems in 1975.

Fluegel graduated from the University of Connecticut.

• • •

PAUL G. RYAN has been named management information systems manager at FMC Corp.'s Woodlands Equipment Division in San Jose, Calif.

Ryan joined the division, which manufactures high-speed steel track vehicles for logging and other such applications, after 10 years of DP experience with General Electric Co.'s Nuclear Energy Division in San Jose.

The new manager holds a B.A. in public administration from San Jose State University.

• • •

JON H. WOOLLEY has joined *Newsweek* as director of information systems after 13 years at Time, Inc. For the past six years, Woolley was director of Time's New York DP operation.

Woolley is a graduate of The Manhattan School of Music, where he studied composition.

• • •

PHILLIP F. STAMBAUGH has been appointed vice-president and division head of the Automated Customer Services Division, State Street Bank and Trust Co. in Boston.

Stambaugh worked for IBM for 10 years.

He is a graduate of Rockhurst College in Kansas City, Mo., and pursued doctoral studies at the University of Wisconsin.

• • •

THOMAS R. AMBLER has been named senior vice-president of the Systems Division at Kranzley & Co., Cherry Hill, N.J.

Ambler joined Kranzley & Co. in June 1966 after seven years of systems analysis, programming and software development experience. He was formerly employed by First Pennsylvania Bank and RCA Corp.

• • •

RAYMOND W. ADAMS has been named operations staff director — data base administration for GTE Data Services in Tampa, Fla.

After five years in the Advanced Technology Department of IBM's Systems Development Division, Adams joined GTE Data Services in June 1970 as a senior technical analyst for Technical Services' Application Support Unit. He subsequently served as systems supervisor and manager and then as operations staff manager for technical servcies.

Adams holds a degree in business administration from Marist College, Poughkeepsie, N.Y.

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Intelpost to Be Tested

Post Office Implementing Electronic Mail Plans

By Edith Holmes
CW Washington Bureau

WASHINGTON, D.C. — Neither rain, snow, sleet, dead of night nor competition will keep the U.S. Postal Service from fulfilling what it believes to be its role in electronic mail.

That was the message delivered here recently by Postmaster General William F.Bolger at National Postal Forum XII.

Bolger, who presided over the forum, pledged his service's commitment to "upgrading the mail system's ability to meet increasing competition and to serve the nation's communications needs" with the formal announcement of an electronic mail offering.

As a joint venture with Western Union, Electronic Computer-Originated Mail (Ecom) has been under development for several months, but the post office formally filed the service with the Postal Rate Commission on Sept. 8, according to post office official John Wargo [CW, Aug. 14].

Introducing 'Intelpost'

The Postal Service also used the occasion of its annual conference to give a date to its plans to test an international electronic mail system that will rely on satellites.

Intelpost, a combined effort betwen the Postal Service and Communications Satellite Corp. (Comsat), will be tested beginning in March 1979 and will involve the UK, France, West Germany, The Netherlands, Belgium, Iran and Argentina, in adddition to the U.S.

With these governments' cooperation, the Postal Service will send messages to and receive them from these countries using advanced computer and communications technology, Bill Miller, a Postal Service representative, said. The international mail used in the test will be encrypted for transmission and converted back into hard copy for post office delivery in each country.

These nations were chosen for the test because their government-run post offices are already working on electronic mail, Miller stated. The U.S. and foreign postal services expect Intelpost's customers to be governments, multinational corporations, banks, world trade centers and importers and exporters.

All About Ecom

Ecom will serve business users who generate messages on their in-house computers for delivery to several addressees, Wargo explained. A small business with a large number of the same message to send could employ a service bureau to generate the tape with the message and addresses.

Considered a subclass of first class mail, Ecom will deliver these tapes to Western Union which, in turn, will transmit the messages electronically in Zip Code sequence to 25 post offices throughout the nation.

The Postal Service will use high-speed printers to transfer the messages to hard copy, folding and sealing them in envelopes and processing them as first class mail, Wargo said.

This venture into electronic mail should cost businesses 35 cents to 50 cents for each message sent to an addressee and will guarantee two day delivery service. Unlike the mailgram — another semiautomated mail service offered by the Postal Service and Western Union — Ecom will depend on volume.

The Postal Service expects Ecom to appeal to a few business users with large mail volumes. Postal officials project the system will carry 5,000 to 50,000 messages per month for each customer and 200 to 2,000 messages at a time. Mailgrams are usually messages sent to one individual.

Ecom is an initial response by the Post Office to an increasing mail volume but a decreasing share of the message market. The post office mail volume grows 1% to 2% each year, but the market is advancing at 5.5%, Wargo said.

In 1950, the Postal Service delivered one out of every three messages. By 1985, the Postal Service will handle only one out of every eight.

Wargo noted the post-office estimates about 60% of its first class mail volume is vulnerable to erosion by competition from electronic funds transfer (EFT) systems, an alternative to business use of the traditional mail system and the nearly universal use of the telephone.

In addition to Ecom, the Postal Service is investigating an electronic ticketing system that would permit ordering airline tickets, for example, by phone and receiving them in the mail the next day. Successfully tested in Dallas with Braniff Airlines and the post offices in that city, this service drew fire from travel agencies who felt the Postal Service was infringing on their market, Wargo said.

The Postal Service is also examining means of offering post office to post office money orders and a facsimile service for delivery of good quality, hard-copy messages to business and other customers, he added.

The Postal Service made it clear it doesn't want "to just remain a delivery service. Until we're told we shouldn't be in electronic mail, we must deliver the mail and we intend to do that in the most efficient manner possible," Wargo stated.

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How Does Psi Task Effect Brain?

Duke University Mini May Solve ESP Enigma

By Tim Scannell
CW Staff

DURHAM, N.C. — Parapsychology, the study of a relatively unexplored dimension of human behavior that encompasses everything from clairvoyance and extrasensory perception (ESP) to the mind-over-matter activities of psychokinesis, is the focus of a computer-controlled study here at Duke University.

Researchers, using a minicomputer and a battery of sophisticated biomedical instruments, are sifting through the tens of thousands of minute electrical signals that pass through the body's central nervous system to find a link between those signals and parapsychological phenomena (psi).

"The general problem we have set for ourselves is whether a person's body, and in particular the brain, is doing something measurably different when the person succeeds at a psi task," Dr. John Artley, a professor of electrical engineering at the university, explained.

> *'The general problem we have set for ourselves is whether a person's body, and in particular the brain, is doing something measurably different when the person succeeds at a parapsychological task.'*
>
> Dr. John Artley

Although numerous psi studies and some "suggested research" have been performed in the past, there have been very few "sustained and systematic" approaches to the problem, according to Artley.

Artley and Dr. Edward Kelly, a research associate, programmed a Digital Equipment Corp. PDP-11/45 minicomputer to conduct a series of decision-oriented tests with prescreened individuals.

The tests determine whether a remotely located stroboscope has flashed once, twice or not at all, Artley said. A warning buzzer is sounded eight seconds before each trial begins, and the test period lasts another eight seconds.

The subject transmits his guess to the computer via a pushbutton device while biomedical instruments measure the person's brain waves, heart electrical activity and muscle tension. The computer regulates the flashing light patterns and repeats the cycle for a predetermined time period.

"The computer actually runs the experiment," Artley pointed out. "Once it's set up, the computer will tell the person when the target is ready and then record the guess and physiology of the person." The data, collected by the instruments attached to the individual, is then stored in the computer and later analyzed for any correlations, Artley noted.

Psi Factors

Individuals selected for the tests do not have to meet any qualifying physical standards, Artley explained, since ESP levels don't seem to be correlate with intelligence or physical traits. However, a test subject must show strong indications of psi activity and be willing to work with the researchers over a long time period.

Thus far, there have been some suggested results pointing to the existence of certain psi factors in a subject's correct guess. The computer recorded a "slight shift in the spectral content" of the electroencephalogram (EEG) or brain wave patterns of a number of individuals just prior to an accurate guess.

Previous parapsychological studies have suggested the shape of the EEG is directly related to the way a person performs some psi tasks, he said.

Measure of Uncertainty

However, since psi and its capabilities are relatively hard to define and even more difficult to determine, the study is surrounded by a certain measure of uncertainty. "The test target is limited to a two-choice situation . . . so a person would be expected to guess [correctly] at least 50% of the time," Artley observed.

In addition, "a person who is doing well in a psi test will very often be a fairly active individual who tends to move about." This multiplies the standard problems which prevent the biomedical equipment from producing "good, clean physiological data."

At least three years of planning and programming have gone into developing the system and the tests to arrive at this point, Artley explained. "We're growing with the system, of course, as we learn more about the processes." Most of the tests are, in fact, exploratory and the results of those tests are partly why the research continues, Artley said.

As expected, there is also a great deal of skepticism generated both by Artley's colleagues and Duke University's officials. However, "skepticism can be healthy," Artley declared."

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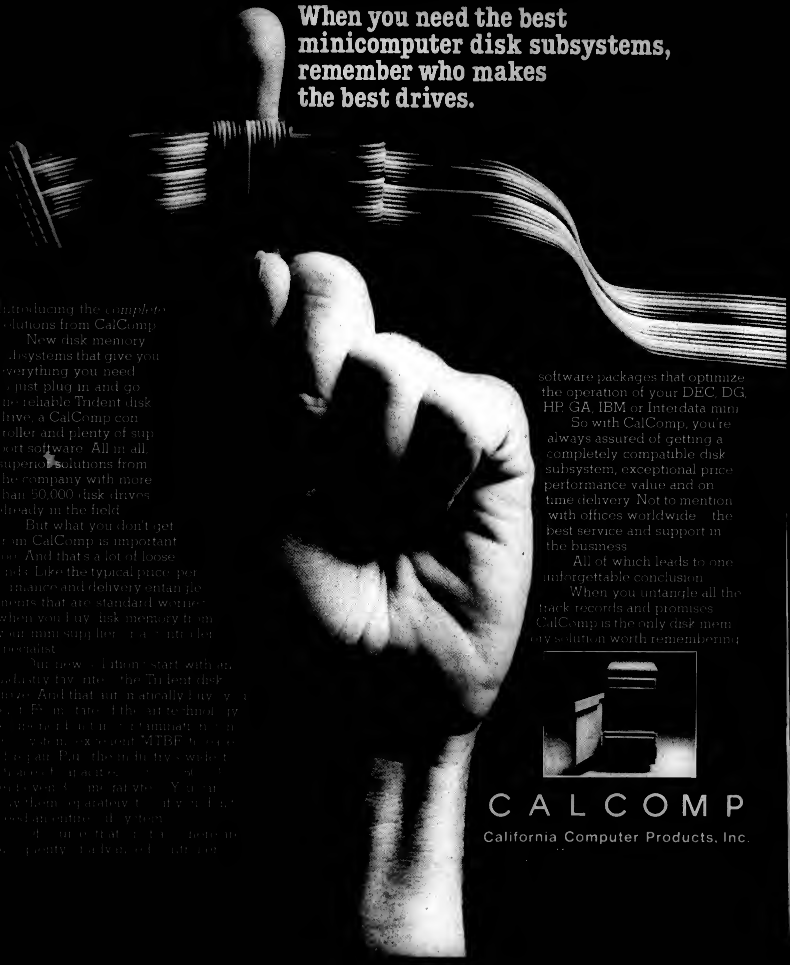

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T/S System Charts Trends for Trading Firm

By Ann Dooley
CW Staff

BOSTON — Precious Metals Associates Commodities, Inc. (PMA), a company which deals with large amounts of commodity trading information, is using a time-sharing system to process and monitor trends in the market.

Still in the installation phase, the system was designed to keep track of customer records as well as monitor daily reports issued by government and private trade forecasters. As the data is compiled, the system helps PMA traders interpret it so they can determine what commodities to buy or sell.

The international trading firm enters its data on several Digital Equipment Corp. Decwriter II terminals located in the office and transmits the data via a Software Dynamics, Inc. time-sharing system to a DEC PDP-11 minicomputer. Information concerning client files and statistical trends in the commodity industry are sorted on floppy disks.

PMA recently converted to an automated system to alleviate the heavy workload generated by two principal company functions: the proprietary accounting service in which the firm monitors client accounts and the statistical data record, which is published daily and keeps track of the changing commodities market.

Tracking client files and keeping on top of the changing commodities market is too large a job to be done manually anymore, Terry Young, PMA trading advisor, explained.

The system provides monthly statements for the client, transaction statements, net results and a quarterly tax format of each client's commodity tradings. Data on import and/or export trade agreements and shifts in government economic policies must be continually updated and interpreted so the traders can be made aware of the changing commodities relationships, Young said.

By determining the deviations from long- and short-term supply demand trends and expectations, a trader can identify abnormal relationships that can be converted into profits for investors, he said.

Helpful Functions

The computer system's strong point is its ability to organize and review large quantities of data and to detect trends and abnormal price relationships that would remain otherwise unknown, Young explained. By using a computer, PMA traders can apply technical trading theories and perform fundamental analyses in a fraction of the time it took to do them manually, according to Young.

In addition, the automated system allows advisors to apply money management techniques more effectively to control the risks in the commodities market, where short-term price swings can be sudden and substantial, he said. The statistical and money management work done by the system is key to the trading work being performed since it indicates the market standings of the 25 commodities with which PMA deals, he noted.

PMA chose DEC hardware because of its reliability and low downtime, Young said, adding it has proven to be a good choice. Software problems have occurred, however, primarily because of the difficulty in communicating complex commodity training concepts to a software company, he said. Once that task is accomplished, Software Dynamics should be able to complete the necessary programming, he added.

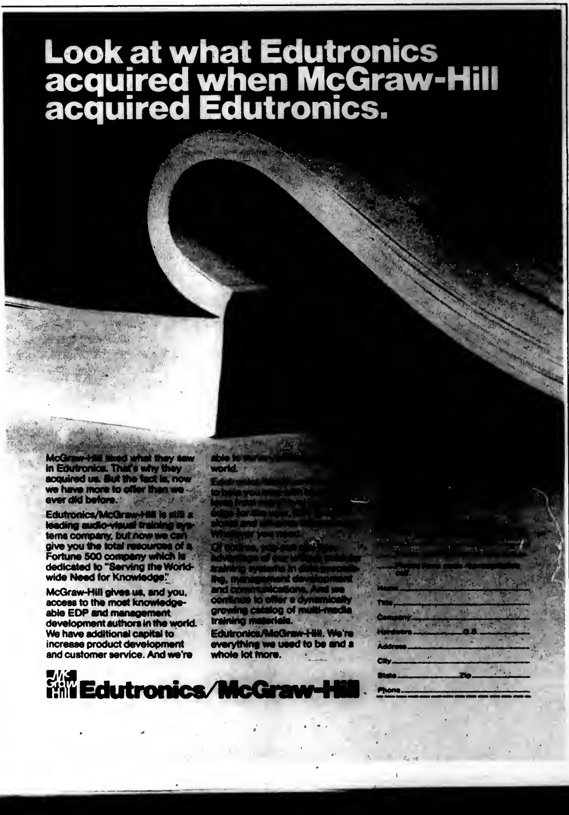
Conversion Process

The system is custom-designed and conversion started about four months ago. "It's a big transfer process;" Young said. "We're still getting the system up, so the old manual system is being used while the conversion is in process."

The dual system is time-consuming and expensive; costs have tripled because of the need to verify all information, he added.

Despite present difficulties, the system should prove worthwhile, according to Young. The PMA staff agree and are pleased with the system since it gives traders a jump on any last minute information for their clients.

Once the system is completely up and running, it will cut the workload as well as save time and increase accuracy, he noted. "It will also provide quick insight into the changing trade market," he said.



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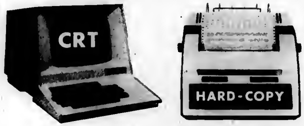

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CCP Exam Review Course Scheduled in Washington

WASHINGTON, D.C. — A seven-day review course for business, scientific and systems programmers planning to take the upcoming Certificate in Computer Programming (CCP) examination will be offered here by American University starting Oct. 21.

The course will meet on the seven Saturdays preceding the Dec. 9 testing date established by the Institute for Certification of Computer Professionals (ICCP), which sponsors the examination.

The review sessions, which will be moderated by instructors from local universities and industry, will cover a common core of materials. Parallel seminars will also be offered, covering the business, scientific and systems specializations.

The course and CCP exam have no specific prerequisites, but are intended for senior-level programmers.

Advance registration for the review program costs $85 for members of ICCP constituent societies and $95 for others. However, after Oct. 1 the cost will be raised to $95 and $105, respectively.

Information and registration material can be obtained from Sam Redwine, Education Committee Chairman, CCP Review Course, Washington, D.C. Chapter, Association of Computing Machinery, P.O. Box 6228, Washington, D.C. 20015.

California Governor Proclaims 'Data Entry Day'

SACRAMENTO, Calif. — Gov. Edmund G. Brown Jr. has officially proclaimed Nov. 1 as Data Entry Day in the State of California. The Data Entry Management Association (Dema) said this is one of the "distinguishing factors" surrounding the Second Annual Data Entry management conference, which will be held in San Diego Oct. 30-Nov. 1 at the Sheraton Harbor Island Hotel.

"The rapid rise in technology in recent years has increased our reliance on people with technical skills, such as DE personnel," Brown said in making the proclamation.

The conference, whose theme is "Data Entry Today and Tomorrow," will include more than 30 seminars, panel discussions and hands-on workshops. "The human aspects of the highly technological profession" will be given particular emphasis, a Dema spokesman added.

Registration for the conference is $250 for Dema members and $285 for nonmembers, with discounts available for groups of three or more from the same company.

Additional information and registration details are available from Dema at 16E Weavers Hill, Greenwich, Conn. 06830.

Washington ACM Chapter To Hear McCracken Predict

WASHINGTON, D.C. — The monthly dinner meeting of the Washington Chapter of the Association for Computing Machinery (ACM), slated for Oct. 17, will feature Daniel D. McCracken, ACM national president, who will discuss the forthcoming decade in computing.

In his speech, "The Next 10 Years in Computing," McCracken will make predictions for the industry in relation to the technological developments and advancements of today, a spokesman said.

The guest speaker has served as the association's president since July 1; he was formerly ACM's vice-president.

He is also the author of 15 DP-related books including *Digital Computer Programming* (1957), reportedly the first textbook written on programming.

Dinner reservations cost $8 for both ACM members and non-members; the speech, following the dinner, is free.

Additional information can be obtained by contacting Jane Olmer at Price, Williams & Associates, Inc., 8630 Fenton St., Silver Spring, Md. 20910.

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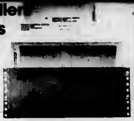

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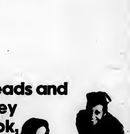

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Jury Duty Wait Cut by Five Days

Selection System Speeds Up Wheels of Justice

By Tim Scannell
CW Staff

CLAYTON, Mo. — Court administrators here, seeking to speed up the sometimes sluggish wheels of justice, have initiated a computerized juror selection system that reportedly reduces the waiting time for jury duty from one week to two days.

The system is built around an IBM 370/145 computer which is used to prescreen prospective jurors and provide judges and lawyers with some of the basic information concerning each individual. The biographical information prepared by the computer includes any previous jury duty, relationship to a law officer, occupation, employer, marital status and other data relative to the judicial case in question, according to Robert G. Ruhland, director of judicial administration.

"In the past, a panel of 40 or more people had to sit in a courtroom while lawyers and judges asked each one the same questions over and over again," Ruhland explained. The computerized system "has speeded up the judicial process and hopefully will improve people's attitudes toward jury duty."

Biographical Information

Jury candidates are selected from a pool of more than 750,000 names picked from the St. Louis County voting rolls and the state's driver license files. "The computer merged those two files, weeded out the duplicates and made up an overall list of possibilities," Ruhland said.

Along with a summons, prospective jurors are sent a postcard containing 10 autobiographical questions or "questions that are usually asked in every case."

The completed postcards are then returned to the court and input to the computer. When a jury panel, usually consisting of 40 people, is randomly selected by the computer, the machine also supplies "about four or five lines" of biographical information based on the postcard replies from each person, Ruhland stated.

The list of names and pertinent data is then given to the attorneys and the judge to alleviate the screening process.

"Now they [court officers] can get right to questions involving that particular trial," Ruhland pointed out. "Lawyers do not have to ask those 10 questions of those 40 jurors" which basically eliminates "400 questions . . . and 400 answers."

Moreover, Ruhland observed, if jurors are excused in one courtroom, "they can go immediately to another for possible selection. If someone isn't selected for a case in two days, that person is released. "We anticipate that [the system] will save thousands of dollars annually in jury fees alone," Ruhland said.

Allows Privacy

The system, acting as a mediator between a candidate and the court, eliminates the need for a prospective juror to publicly give personal information in a courtroom full of a defendant's "friends and relatives," Ruhland commented. "I think it makes a person feel much more comfortable doing it this way."

Confidentiality is essentially not a problem, Ruhland said; as each juror is recruited and serves, his file is purged. "The computer handles the payroll and at the end of a person's service . . . his personal information is automatically purged," he noted. "We really have no reason to keep anything."

Although there is presently no statute of enforcement directly connected with the DP-based selection system, people have been generally cooperative with the prescreening procedures and postcard returns, Ruhland stated. However, if a person does refuse to answer the biographical questions on the postcard, he must appear before a judge and answer the questions in person.

Failure to comply or cooperate in this case usually results in a contempt charge which can lead to a $50 fine.

IIA, UK Group Establish Unit On Data Flows

WASHINGTON, D.C. — The Information Industry Association (IIA) and the UK's Association of Data Base Producers have joined forces to establish an international organization that will examine and seek to minimize the restrictions placed on the flow of data across national boundaries.

The International Secretariat for Transborder Data Flows will promote international interest in reducing tariff and nontariff barriers to the flow of information, according to a spokesman.

The secretariat will also promote increased competition between suppliers of information technology and concentate its efforts on bringing information and state-of-the-art techniques to users at "bargain prices," he added.

Additionally, the secretariat will focus on the practices of certain governmental bodies, such as the United Nations Educational, Scientific and Cultural Organization (Unesco), which have both immediate and long-term impacts on international data transactions, the spokesman continued.

As a result, the Secretariat is exploring the creation of a non-government organization as an "officially recognized voice for this international constituency," according to Paul G. Zurkowski, president of the Information Industry Association (IIA).

The secretariat is administratively based at IIA headquartes, Suite 904, 4720 Montgomery Lane, Bethesda, Md. 20014.

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Security Workshops Set

PHOENIX — Internal computer security, disaster recovery planning and risk analysis will be among the topics discussed during Honeywell, Inc.'s Computer Security and Privacy Workshop series scheduled for Sept. 26-28, Oct. 10-12, Nov. 14-16 and Dec. 5-7 here.

Using the case study method, the workshops will examine the planning necessary for a secure system and focus on physical security, computer auditing, security responsibilities, system monitoring and surveillance and current privacy legislation.

The sessions will be highlighted with accounts and discussions of computer-related frauds, thefts and abuses that maximize the importance of effective security procedures, according to a spokesman.

The seminars will be conducted by Jerome Lobel, Honeywell's manager of computer security and privacy education.

Registration fees for the courses are $425, with a $50 discount if payment is made 30 days before each session's start. An additional $25 discount is extended to teams of two or more from the same company whose preregistration and payment are received 30 days prior to the workshop.

Information and registration materials are available from Honeywell, Inc., P.O. Box 6000 (M/S T60), Phoenix, Ariz. 85005.

'How To' Course to Focus On Reducing Vulnerability

TOLEDO, Ohio — A three-day "how-to" seminar that focuses on minimizing a corporation's security vulnerability and implementing preventive safeguards will be held here at the University of Toledo on Nov. 29-Dec. 1.

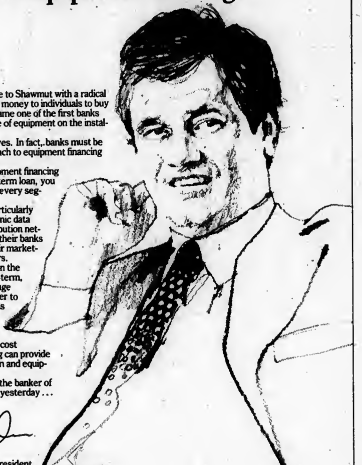
"How to Protect Your Organization From Computer Fraud, Embezzlement and Costly Information Leaks" will present step-by-step methods for identifying and halting corporate security violations, a spokesman said.

The course will also discuss current and pending computer security legislation, techniques for gearing up for privacy protection and the expected responsibilities of personnel, from management to programmers.

Speakers for the sessions will include Elizabeth Adams, associate professor of management at George Washington University and editor of *Case Studies in the Management of Information Technologies*, and William Wenker, a specialist in technological safeguards for the U.S. Air Force Data System Design Center.

The course is geared to the needs of controllers, DP managers, auditors, corporate security officers and human resource managers.

Registration fees for the seminar are $425. Further information and registration applications are available from the University of Toledo, 2801 W. Bancroft St., Toledo, Ohio 43606.



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Distributors and wholesalers, on the other hand, have a need for short-term, ongoing financing as they move huge inventories daily from manufacturer to end-user. Here, the critical need is for responsiveness.

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Brian Elsden, Vice President

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White House Fellows Program Seeks Applicants

WASHINGTON, D.C. — Applications are now being accepted for the White House Fellowships program, which brings as many as 19 individuals into the federal government to work as high-level special assistants for a period of one year.

Fellows serve with pay as assistants to the White House staff, Cabinet officers and the Vice-President. The purpose of the program is to promote a greater understanding of the government.

The program is open to all U.S. citizens except federal employees.

Applications and information concerning the Fellowships program are available until Nov. 15; completed applications must be returned no later than Dec. 1.

Interested candidates can obtain further information from the President's Commission on White House Fellowships, Washington, D.C. 20415.

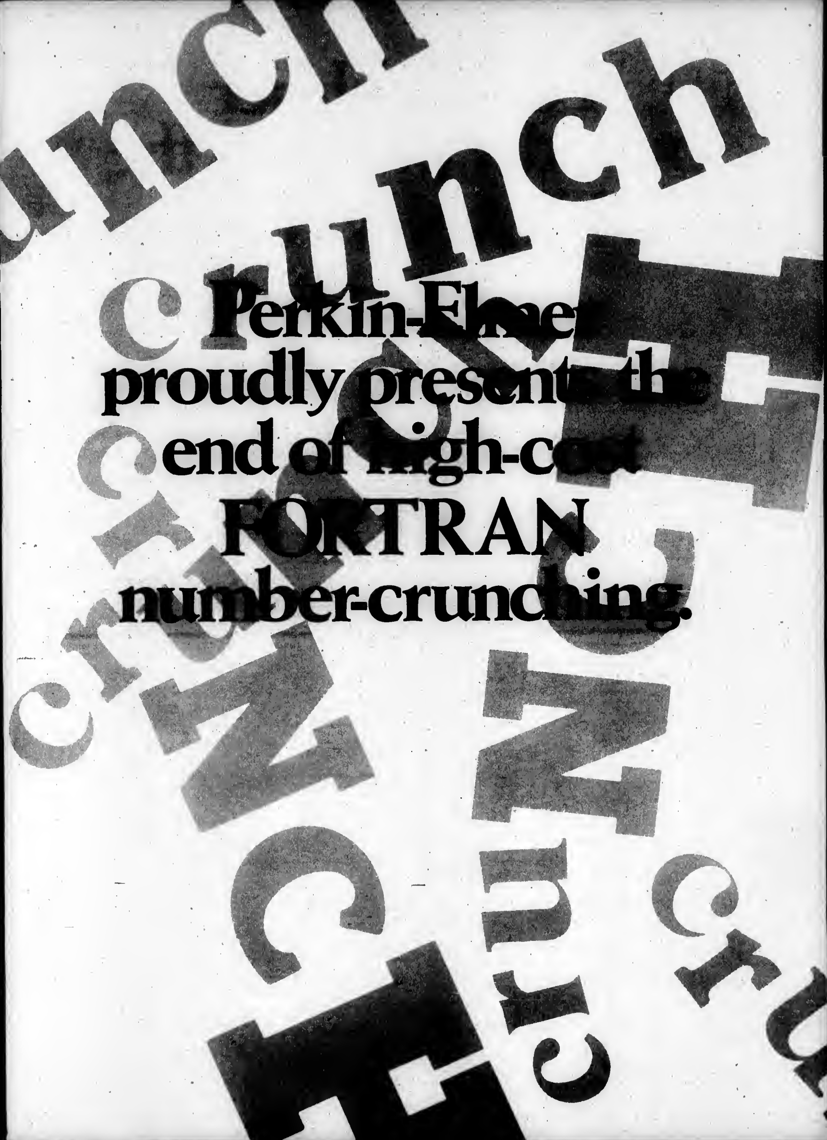
NBS Guideline Codes Locations

SPRINGFIELD, Va. — A guidelines published by the National Bureau of Standards (NBS) is said to reduce the amount of confusion associated with handling city- or town-related information by using a series of standard identifying codes.

Available in various forms from paper to magnetic tape, "Codes for Named Populated Places and Related Entities of the States in the U.S." (Federal Information Processing Standards Publication 55) lists more than 136,000 cities, towns and places, as well as their respective seven-character codes.

The geographical coding system used covers U.S. localities ranging from urban townships to Indian reservations and will be incorporated into the statistical files of the 1980 population census, a spokesman noted.

The directory costs $12.50, in paper or on microfiche, $17.50 on computer output microfilm and $125 on magnetic tape from the National Technical Information Service, U.S. Department of Commerce, Springfield, Va. 22161.



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Meet on DP Impact to Examine Office

DELRAN, N.J. — Datapro Research Corp. will host a conference in November in New York City on the major structural changes computer technology has begun to dictate to business organizations.

Focusing on the office environment, the meeting will examine new approaches to management brought about by the development of microprocessors, minicomputers and data communications networks and the continuing reduction in the unit cost of data processing.

The conference, to be held at the Americana Hotel from Nov. 28-30, will also explore the role of computers and communications in "the organization of the '80s."

Keynote and featured speakers will include Dr. V.E. Herzfeld, vice-president for business planning and development at Univac; Paul G. Zurkowski, president of the Information Industry Association; John Gosden, vice-president, Equitable Life Assurance Society; and Charles P. Lecht, chairman and president of Advanced Computer Techniques Corp.

Titled "Information Technology and the Office," the meeting will wrestle with the issue of central control and management of system resources vs. distribution of capabilities and people.

The conference fee is $540; Datapro subscribers may attend for $490. Enrollment fees received prior to Oct. 28 will be reduced to $485 for nonsubscribers and $450 for Datapro readers.

A brochure on the conference and further registration information is available from Don Welsher at Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

Calendar

Oct. 16, Washington, D.C. — **Computer Law Association Conference**. Contact: Michael Yourshaw, Room 1100, 1776 K St. N.W., Washington, D.C. 20006.

Oct. 16-17, Washington, D.C. — **An Introduction to Basic Concepts and Systems,** sponsored by Atlantic Research Corp. Contact: Atlantic Research Corp., Teleproducts Division, 5390 Cherokee Ave., Alexandria, Va. 22314.

Oct. 16-18, Chicago — **1978 National Communications Forum**, sponsored by National Engineering Consortium, Inc. Contact: National Engineering Consortium, 1211 W. 22nd St., Oak Brook, Ill. 60521.

Oct. 19-20, New York — **How to Get the Most Out of Your Telecommunications Dollars**, sponsored by Executive Enterprises, Inc. Contact: Executive Enterprises Publications Co., Inc., 33 W. 60th St., New York, N.Y. 10023.

Oct. 23-24, Chicago — **Seminars on Classification and Coding,** sponsored by Manufacturing Data Systems, Inc. (MDSI). Contact: Carol Wilson, MDSI, 4251 Plymouth Road, Ann Arbor, Mich. 48105. Also being held Oct. 26-27 in Los Angeles and Oct. 30-31 in Hartford, Conn.

Oct. 23-26, Chicago — **Fall 1978 Telephone Seminar Series**, sponsored by the Communications and Information Institute and Telephony Publishing Corp. Contact: Donna Ahrend, Director, Communications and Information Institute, Suite 212, 167 Corey Road, Brookline, Mass. 02146.

Oct. 23-27, Boston — **Data Base Concepts and Design**, sponsored by American Management Association (AMA). Contact: AMA, 135 W. 50th St., New York, N.Y. 10020.

Oct. 24, New York — **Transitions in Federal ADP Procurement**, sponsored by the Federal Information Processing Council of Region Two. Contact: Peter C. Daikos, P.O. Box 902, New York, N.Y. 10008.

Oct. 29-Nov. 2, San Francisco — **Bank DP Audit Conference,** sponsored by the Bank Administration Institute (BAI) Contact: BAI, P.O. Box 500, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

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The basic model 43 series operates on line at 10 or 30 cps in either the half or full duplex mode and prints multiple copies using the 96 character ASCII code set. A wide choice of interfaces, including EIA RS232C and DC 20/60ma, are available for easy system integration.

With the automatic send-receive configuration, messages can be prepared off line via the paper tape punch, edited, or batched with a master tape, then sent at maximum terminal speed—automatically and unattended—when line rates are lowest.

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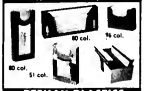

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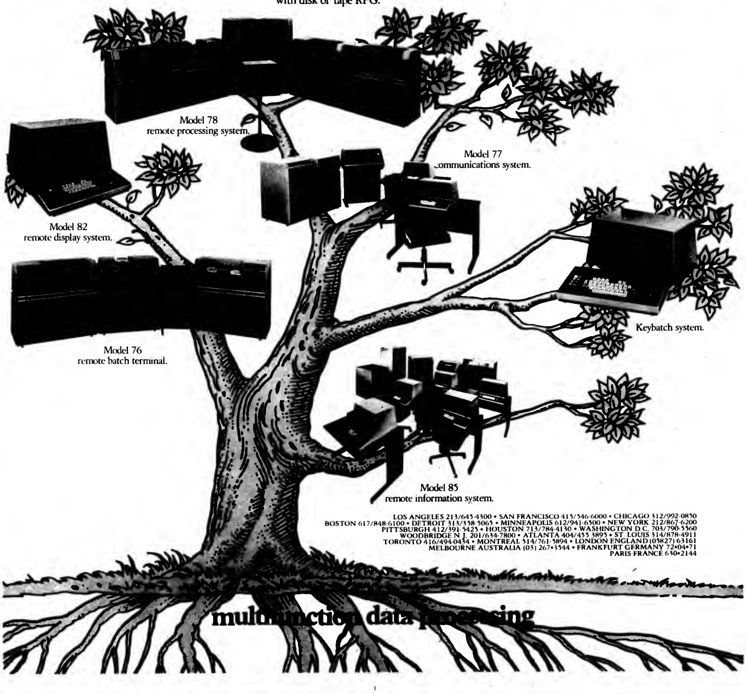
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Editorial

Procurement Paradox

The House of Representatives Appropriations Committee is now considering a staff committee suggestion that federal agencies use architecture-specific requests for proposals [RFP] to procure DP goods and services [CW, Sept. 18]. While this means an RFP would identify a particular system, it does not mean the RFP would be directed to a particular vendor.

Instead, the RFP would call for an "IBM 370/158 or equivalent," for example, on the premise that plug-compatible systems are available from IBM competitors.

This proposed switch in procurement policy might seem paradoxical, but many in government believe architecture-specific RFPs would elicit more responses than traditional RFPs, which stress performance and overhead demands and — supposedly — shy away from suggesting systems on which anyone could put a name.

The DP industry, however, has entered the age of "generic" computer systems — an age in which a number of architectures from competing vendors are compatible.

The Appropriations Committee was told by its investigative staff last May that plug compatibility through firmware emulation should be encouraged by the federal government, since emulation could obviate the need for costly system conversion in many cases.

"Conversion is a protectionist strategy that complicates free and open competition to the advantage of the vendors. If vendors choose, they could successfully compete against one another's product lines with plug-compatible equipment; however, the overriding motivation appears to be the retention of existing customers," the investigators explained.

Federal encouragement of plug compatibility should be conveyed through architecture-specific RFPs, the investigators advised, pointing out that the Department of Defense has already tried this procurement approach with considerable success.

Appropriations has in turn indicated to the whole of Congress that architecture-specific procurement may eventually be worth trying on a massive scale, but also noted that many complex legal issues associated with DP procurement should first be resolved.

The adoption of architecture-specific procurement practices could have a devastating impact on vendors not currently committed to plug compatibility. To stay competitive, such vendors would either be forced to enter this marketplace and face accelerated competition or would need to abruptly attain a level of technological stature clearly above IBM and the current plug compatibles.

There's another aspect to this situation; non plug-compatible vendors would need years to react to the sudden adoption of an architecture-specific procurement policy. IBM and the plug compatibles would have an enormous advantage in the interim.

In the light of recent government reports critical of federal DP procurement practices, the computer industry must now truly wonder: Does the government have the talent to deliver a fair and wise resolution of this complex issue?

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Jim Orton Computerworld

Letters to the Editor

ECPS Benefits Ignored

The recent discussion in *Computerworld* concerning IBM's Extended Control Program Support (ECPS) [CW, Aug. 28, Sept. 4] tended to ignore the most significant aspect of this feature: the dramatic performance improvement it provides to ECPS users.

With this feature installed, extensive benchmarks have verified throughput increases in excess of 2 to 1 [Horton, 1974; Koplin, 1976; Stockenberg, 1978]. In his two-part article, Charles Cornell only briefly referred to this subject and the editorial [CW, Sept. 11] ignored it completely.

The thrust of Cornell's article and CW's editorial seemed to be to scare IBM users away from the potential benefits of ECPS — like enhancements. Both CW and Cornell stressed the significance of changes occurring at the software/hardware interface that are completely hidden by the operating system in use with these features.

To efficiently utilize changes which are occurring in technology (specifically large, cheap control stores) it is necessary to change the hardware/software interface. In the case of ECPS, this has been done with no impact on user programs.

Only the plug-compatible CPU manufacturers have anything to lose by these changes. The fact that CW has become a sounding board for their sour grapes is disappointing to a reader accustomed to its normal unbiased reporting.

Joseph E. Stockenberg
Portsmouth, R.I.

Sole-Source Procurements

Rep. Jack Brooks' comments as quoted in *Computerworld* [Sept. 4] are bound to strike some responsive chords, especially as they bear on conversion to higher level languages. He is to be commended for once more urging such conversions so that federal users can avail themselves of the advantages long enjoyed by private-sector users who have long since converted to gain standardization, portability, maintainability and hardware independence.

As taxpayers, we applaud his objectives. As DP professionals, we encourage his efforts to stimulate competition in our industry. There are instances, however, when sole-source procurements, especially of software, can aid greatly in achieving the overall goal of increased efficiency and reduced costs. To encourage further discussion of this issue we are inviting Rep. Brooks and representatives of the federal DP community to participate in a forum that we shall sponsor during the Federal Computer Conference, Nov. 7-9, in Washington, D.C.

Most recently, perhaps in anticipation of Rep. Brooks' comments, a U.S. Army agency authorized a sole-source procurement of our proprietary 1400-series object to Cobol translator because it is, in fact, the only such program available. Thus, a sole-source software procurement is making possible competitive hardware procurements in the future. At the same time, this agency will realize all the operational benefits of conversion on its current configuration.

John E. Czerkies
President
C.S. Computer Systems, Inc.
New York, N.Y.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
Sept. 26, 1973

TULSA, Okla. — Judge A. Sherman Christensen found IBM guilty of monopolizing the computer industry in the Telex Corp. vs. IBM antitrust suit here and ordered IBM to pay Telex $352.5 million in damages. The ruling also prohibited IBM from enforcing penalties on long-term contracts and barred the firm from offering long-term contracts with penalties for three years. IBM was also ordered to release interface specifications on new products at the time of announcements and to release details on 370 interfaces within 60 days.

Separate pricing was ordered for CPUs, memories and peripheral equipment, and IBM was also enjoined from adopting, implementing or carrying out predatory pricing, leasing or other practices with intent to maintain a monopoly in the peripherals area.

Telex was ordered to pay IBM $21.9 million for misappropriation of IBM trade secrets.

Eight Years Ago
Sept. 30, 1970

WHITE PLAINS, N.Y. — IBM unveiled the 370/145, intended for the medium-scale user. The company claimed the system had internal operating speeds up to five times those of the 360/40 and 11 times those of the 360/30. The system marked the first use of semiconductor main memory by a major manufacturer.

— — —

DAYTON, Ohio — NCR Corp. announced a 300 system for the Century series that gave users internal speeds five times faster than those available on the Century 200. The 300, third and largest system in the line, included a magnetic core memory instead of the thin film rod memory previously used on most Century systems.

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By Jack Stone
Special to CW

One of the fascinations we share in this business is watching the rise and fall of information systems managers.

My impression, up until recently, has been that more managers fall than rise. But now I think the facts belie such a notion. After all, systems continue to grow, applications backlogs continue to mount and machines are more pervasive than ever.

Most significant has been the great success of on-line systems which, because of their visibility, have been a major factor in the elevated importance of the information systems manager. In my opinion, with on-line systems, the promotion potential of the information systems is greater than with batch systems.

It seems to me, a person who leads a winning on-line systems effort demonstrates some key qualities of the executive. He has the ability to understand and respond to user needs (business management), deliver a complex service (project management), come in at the budget line (financial management) and apply the latest and greatest in computer electronics (technology management).

Increasingly, organizations are tying their future growth — or, in some cases, survival — to the expansion of information systems support. It really counts at the credit counter, the reservations terminal and the raw materials control station. And this requires on-line, real-time systems and the application of leading-edge technology.

It further suggests all major operating areas will be targeted, sooner or later, for information systems applications, and the top person will have to know the firm's business in depth.

Data From Interviews

In its Aug. 7 issue, *The Wall Street Journal* (WSJ) presented the results of informal interviews of executive placement agencies regarding growth into the executive ranks of information systems managers. While one might feel such interviews could suggest certain biases, there were too many optimistic reports to justify such a conclusion. Witness these items reported by the WSJ and followed by my comments:

- Top information systems people are now receiving vice-president titles appropriate to corporate and divisional officers.

Presumably some are elected; others are appointed, but it certainly is in the right direction. Although there have been few reports about former DP managers now controlling major corporations, such a possibility exits.

- The comment of one agency spokesman was fairly typical: "A few years ago, the DP manager was really a technician. He had very little business background and did whatever the company president asked him. But there's been a big change because the wrong DP policy decision can kill a company.The typical DP manager now is a businessman, responsible for telling the company president what should be running on the computers, how it can be cost-justified and how to improve the bottom line."

While the quotation is impressive, a word of caution is needed. The statement implies the typical DP manager is promoted from the technician ranks. But I know of a number of cases where the DP rascal was thrown out in favor of a financial wizard or operations person who had important knowledge of the enterprise and the user population — in each case, the designee knew little about technology.

DP Salaries

- A recent salary survey reported the previously fast-moving salaries for the typical DP person have stabilized and may be losing ground to inflation. This situation was attributed to the increased supply of DPers from training and educational institutions.

But the survey indicated the salaries of top people are increasing rapidly. It estimated average salaries grew from $24,000 to nearly $37,000 in the past seven years.

- In specific cases, compensation for the top management information systems (MIS) people has gone through the roof. Not only are the new breed of corporate officers qualifying for special stock options and bonuses, but one recruitment agency reported filling three positions for salaries ranging from $80,000 to $135,000 per year.

Letters to Stone should be addressed to him at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

Reader Commentary

From Tubes to Micros, User Has Faced Change

By Jim Ryan
Special to CW

One of the advantages of being retired is freedom from schedules, due dates,and deadlines so one may concentrate on the more abstract features of life. This is a rare luxury indeed — probably not very productive, but more interesting than the deadly job of meeting production schedules.

Being retired in the late 70s has an additional feature, particularly if you have been in the electronics business for the last 40 years. As the years went by, I didn't realize what was happening, but Monday morning quarterbacking tells me I lived through the most changing technical period in the history of the human race. I wonder how I survived!

I remember the 30s, when everybody was broke and the Radio Shack was a wonderful assortment of parts from which we patched together all kinds of circuits. The name of the game was to make radios work by magic, at no cost. Innovation and ingenuity were at a premium, but there was no way to repair a burnt-out filament in a tube. Unfortunately, filaments had a very poor life span.

Those were wonderful years for browsing, exploring and experimenting. Mass production didn't interfere with our pleasure. It took World War II to spoil it all.

As the war progressed and I first heard of the Radiation Laboratory, I thought it had something to do with plumbing. The first computers were masses of tubes that dispensed large amounts of heat plus fantastically fast calculations which were measured in terms of equivalent slide rule man-hours.

The electronics world became full of quickly trained specialists for military needs. There were radio specialists, radar specialists, communications specialists, and the rare new breed of computer specialists. Most of us knew something about our own specialty but very little about the other branches of electronics.

After the war, all hell broke loose. Television, transistors and the Information Theory arrived in rapid succession. By this time I was a middle-aged old timer. It was then that I realized life was going to be a constant struggle to keep current with new developments. If I relaxed once, I would be lost.

Advent of Transistor

None of us recognized the transistor's potential when it appeared on the scene. Even the inventors had not started out to build a transistor.

Soon all of the fun went out of the electronics business when a mass production manufacturing

(Continued on Page 30)

The Taylor Report

Poll Shows Reader Fear Of Auditor-Sold Services

By Alan Taylor
Special to CW

The results of the recent questionnaire on whether auditors working for public companies should be allowed to sell management advisory services to their clients (CW, Aug. 7) showed a margin of more than 6:1 against it. When I eliminated auditors and software sellers, the ratio was more than 10:1 against.

Here was strong evidence that the Chicago Public Oversight Board (POB), formed to investigate whether auditors who sell DP-related services cause a conflict of interest, should have had far more information available than it did have at that rushed August hearing — and that the board is now in no position to approve such services — which include programming, systems design and system selection. Hopefully, the board will carry out this preparatory work before publishing a report of its findings in the near future.

Two additional areas should be taken into account:

- Actual and implied coercion of clients and their staffs.
- The recruiting practices of the auditing firms.

Readers responding to the questionnaire frequently pointed to these areas as being of very high concern; neither was mentioned in the Aug. 7 Taylor Report.

The top-scoring items of concern are shown in the accompanying box. Loss of independence disturbed the respondents more than anything else.

James, a data base administrator from the South, pointed out, "Those services [provided by auditors] which will be subject to a direct or indirect review by the same auditors" causes the review to lose its integrity.

David, a data base administra-

(Continued on Page 28)

HIGHEST FREQUENCY

- Loss of Independence
- Marketing Consulting
- Marketing Products

HIGH FREQUENCY

- Coercion
- Recruiting Services
- Favored Access to Information and Management

MEDIUM FREQUENCY

- Billing Methods
- Service Quality
- Auditor's Staff Skills
- Quality of Results

Shown above are the concerns expressed by readers responding to the questionnaire on whether auditors should offer DP-related services. The concerns are listed according to the frequency with which they were expressed.

Readers Fear Auditor-Provided Services

(Continued from Page 27)

tor from the Northeast, agreed that credibility is an important issue. He feels the audit firm tends to hold back criticism to avoid harm to the main audit relationship.

The unfair marketing of consulting services and products ranked next in importance to the respondents. Many were disturbed by the advantages held by auditors who sell DP services and products.

Recruiting Practices

Recruiting practices of the auditing firms were also of central concern to the readers. David, a hardware manager from Texas, made a comment typical of many readers.

He noted that auditor's management aids tend to create "new" positions that are often filled by professionals chosen by the auditors and that sometimes former employees of the audit firm replace the key personnel in the installation. These are sometimes older auditors, tired of traveling around and eager to settle into a steady, high-level job.

You can imagine the resulting morale problems and the consequent turnover, opening still other positions for auditor-influenced replacements. An R&D manager from Illinois echoed David's feelings, noting that when the auditing firm acts as a recruiter, the new employees are indebted to them and unable to treat fellow DP professionals with full consideration.

People are clearly *afraid* of the auditor's political and legal power. Fear scored as high on the questionnaire as favored access to people and information.

Various forms of fear were specified by respondents; management intimidation was one. Lou, a corporate executive from Florida, said management is so intimidated that it pays higher than average rates to employ these auditors.

Bob, a DP director from Virginia, didn't talk about the details of his knowledge, simply commenting: "To describe specific cases would identify the firms — and without hard evidence, this would be subject to libel claims."

Note that Bob did not say successful claims — an unsuccessful claim by a big firm can ruin almost any employee who has to go it alone.

Other respondents didn't want to contribute any written knowledge. Dick, a manager of systems planning from the East, wrote that he knew of specific cases "which I would be glad to discuss over the telephone or in person." Look for a call soon, Dick.

Continued Search

Still, fear does not prevent everyone from talking or from keeping quiet the methods used by these audit firms that sell DP-related services to their clients. People have enough to say to make it worthwhile to devote another column to this subject.

So, coming up — a view from the inside of a "Big Eight" firm, one of the top eight audit firms based in the U.S. The firm will be identified and some of its practices will be described — all of which should add substance to the argument.

Please remember, I am always interested to learn more — so keep those letters coming.

Would the anonymous correspondent on this subject please contact me by telephone at my home in Framingham, Mass.

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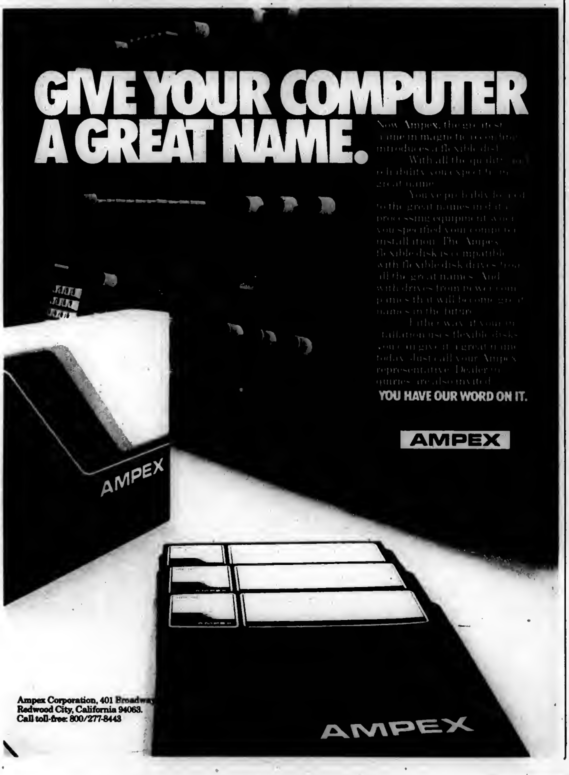
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Letters to the Editor

Attack by Stone Just 'Cheap Humor'

I was astonished to read Jack Stone's absolutely thoughtless and witless attack on Tom Gibson and his language, Tiny C, and on his wife and son as well [CW, Aug. 7]. It is unbelievable that such a completely unwarranted, unprincipled attempt to hold up to ridicule a man who is widely respected, both personally and professionally, and his family as well, should appear in Computer*world*, and all for the sake of a cheap attempt at humor.

Gibson has been a member of the technical staff at Bell Labs for 17 years. He has been a professional programmer for almost as long as there have been computers at Bell Labs. Tiny C is not an "infinitesimal subset of the Bell Labs 'C' compiler language" but the first serious attempt to provide a true high-level language incorporating present-day principles of structured programming, as exemplified by the C language, for all users of microcomputers — and particularly for those who need to learn these principles most, students and computer hobbyists.

Stone's attempt to provide an example of "a computer-based slapstick comedy" cannot help but backfire against both him and CW.

Morris Krieger
Brooklyn, N.Y.

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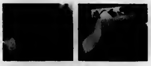

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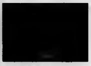

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User Reviews 40-Year Struggle With Change

(Continued from Page 27)

process brought the cost of the transistor down to the ridiculous prices which made it so popular. The fun had moved from the bench to the manufacturer, and the individual became lost in mass production.

Just about the time the transistor became available, the Information Theory was published. This really threw us because of its implications. The combination of the theory and the transistor was the beginning of the digital world. We didn't know it, but we were saying goodbye to the analog world.

As we progressed from solid state, printed circuit boards, integrated circuits to microprocessors, it became increasingly difficult to prevent obsolescence on a personal basis.

Refinements in semiconductors followed each other in rapid succession and packaging achievements went along with semiconductor improvements.

Rise of Software

While all this was happening, software began to be heard from. Software dealt with people's use of hardware, and the computer industry, which had been mostly a scientific development, now had to deal with people and languages. This was a major shock to us old-timers, because with software, there were many solutions to a problem and all of them were correct if we believed the authors.

I think this addition had many more implications than just software programs. It was the beginning of uncertainty and confusion in the computer industry because a touch of imaginative advertising added to the many languages caused even the youth of the industry to acquire a cynical attitude. Those old-timers who survived had long since become philosophical and they were able to adjust to uncertainty. Age may not have brought wisdom, but it sure proved that compromise was a way of life which passed for wisdom.

On we roared into the '70s. The rate of change had now become exponential on all fronts.

Throughout all of these changes, however, some basic thoughts began to come through. The first was that hardware in all applications seemed to be relying more on digital electronics. The lessons learned back in the '40s on information theory and sampling techniques all came together with high-speed switching to provide many applications.

Software took advantage of high-speed hardware to set up elaborate filing systems for storage and retrieval of information, and processing of data became a smaller portion of total systems design.

As the computer industry expands in all directions, perhaps 40 years of living with it gives me a chance to put it in some kind of perspective.

When I look back at the 40 years and review the massive achievements, I am forced to have an optimistic view of the future in spite of the tendency to pessimistically stress short-term problems.

The direction hardware will take is fairly clear as technology continues down the road of miniaturization and sophistication in the management and control of electron flow.

Software and people will be where the greatest possible dangers lie. We are even now suffering from a lack of leadership in exploring the future. Science has always maintained that its job is to explore the unknown without restriction, and for the most part it has been very successful, but only in the unknown. It has no destination in mind.

The problem is that other professions such as government, law, medicine and even religion, to some degree, are adjusting to scientific advances rather than leading them. The result is that we do not have a leader, are not in control of our destiny and, more important than that, we do not know how to control it.

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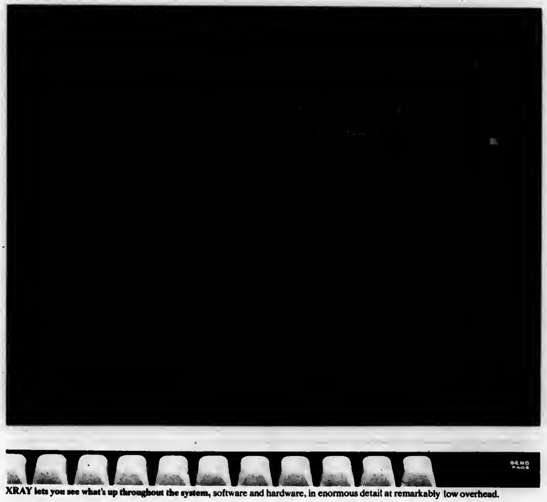

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Reader Commentary

Speedier, But Has Its Problems

Reporter Finds Switch to CRT Disconcerting

We've entered the space age in our newspaper office. Recently we acquired video screens, keyboards and a large, humming box that I promptly named "Hal."

Instead of banging out our stories on vintage typewriters, we now silently "key" them onto big black screens that stare into the newsroom.

It's a disconcerting change for someone like me who used to watch printers lock stories for my high school paper into heavy blocks of metal. Each letter of every story had been individually punched from hot lead by a linotype operator.

When all the metal pieces were assembled into pages, the printers would lift the heavy chases into place on the press.

There's no denying that the introduction of computers' into our newsroom will speed the newsgathering process. Instead of transmitting stories via an archaic machine that requires six minutes per page, we now can shoot them down to the San Mateo office with the mere push of a button.

After the stories are edited, they are fed into another computer that sets type. Out pop finished strips of copy.

During two days of training on our new keyboards, we reporters were delighted to find that we could move whole paragraphs by pushing a couple of buttons, that we would store key phases in the computer's memory, to be recalled upon our command, and that transposing letters and words was a snap.

But we soon learned the perils of computers. First of all, the muse does not come easily when you're eye-to-eye with a video screen. I keep expecting "Looney Tunes" to appear.

Another problem is that the computer sometimes stops in mid-sentence and flashes "DISK ERROR!" At other times it announces, "MEMORY FULL!" — which means you can't make any more changes in your story. And then there's the possibility that a well-meaning editor may change the spelling of weirdly spelled names, leaving no record of the original spelling for conscientious typesetters to question.

But the most rattling feature of the new system is the ease with which a reporter or editor can erase a whole story. So many of my articles have disappeared into thin air that I deliver a silent prayer to the computer god in the sky every time I sign off.

Other disastrous possibilities have been suggested. For example, what if a reporter didn't like you and sneaked into the office at night to push the "KILL" button on your story?

It's going to take me a while to adjust. I miss the clanking of typewriters at deadline time and the reassuring feel of paper.

Author Terry Dovenport is o reporter for San Bruno Herold Publicotions in Colifornio, with whose permission this orticle wos reprinted.

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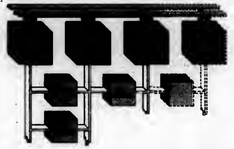

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'Apex' Controls OS-Based Production

McLEAN, Va. — A package that seems to be in the same general class as Panexec from Pansophic Systems, Inc., Dimension V from Software Systems, Inc. and the enhanced schedulers from Value Computing, Inc., the Automated Planning and Execution Control System (Apex) is now available from Johnson Systems, Inc.

Apex solves the problems of data and production control and workload management. in an IBM OS-oriented data center; it controls job preparation, job processing and both pre- and postprocessing events, a Johnson spokesman added.

Developed and already in use in Europe, the system provides centralized control of the production workload based on comprehensive formalized plans kept in an on-line data base. Plans can be altered as needs change; once a plan is in control, however, it apparently copes with whatever happens.

Jobs are automatically submitted for execution in the correct sequence and at the right time without operator intervention; JCL handling in the production environment is eliminated, the spokesman claimed.

Apex detects Abends and incorrect completions and independently takes action to correct the error and continue the job, he added.

The Apex philosophy is based not on modifying the job directly for production, but on specifying all run-dependent data in the plan. Under the plan, Apex summarizes the entire workload to be accomplished by a specific deadline.

In the basic plan, the terms and conditions necessary for plan execution are specified. This basic plan can then be copied at any time and prepared for execution by the operations staff by specifying the currently applicable information and data.

Jobs called for in a plan have Apex control steps which control and check all interdependencies — completion of predecessor work, for example — before the job starts, then release all follow-up work once the current job has been successsfully completed.

Apex is currently available for $20,000 (for the OS version) and $25,000 (for MVS users). Lease and rental plans are also available, the Johnson spokesman said from 7923 Jones Branch Road, McLean, Va. 22102.

DBMS Operations Tuned Through 'Monitor 2000'

RESTON, Va. — One of the questions that nags data base administrators (DBA) — "How well is my data base management system performing?" — may be answered for IBM-oriented users of System 2000, the data base management system (DBMS) from MRI Systems, Inc., with the introduction of Monitor 2000 by CACI, Inc. Federal.

Described as a complete performance monitor system, the package reportedly gives users detailed performance statistics by System 2000 command. The DBA may also recreate entire interactive sessions, performed by users at geographically dispersed sites, to help them with their problems, a CACI spokesman claimed.

The rerunning of sessions enables the DBA to determine and then analyze the areas of heaviest data base use; Monitor 2000 therefore eliminates the guesswork DPers normally go through to isolate improvement areas, he added.

The monitor logs all user input text and as much output text as the installation desires. The DBA may then review the text to see who is doing what on the system.

The command editor feature of Monitor 2000 allows the use of natural language System 2000 to edit query and update commands without exiting from System 2000.

Monitor 2000 also helps users improve the performance of application programs working with the DBMS through System 2000's Procedural Language Interface (PLI) feature. For each PLI statement execution, Monitor 2000 records I/O to data base, scratch, sort and all user files; it also reports CPU time and maximum region used.

The detailed performance data is logged to tape or disk, where it can be used as input to CACI's Quicktab statistical analysis and cross-tabulation data reduction package.

Monitor 2000 functions under OS/MVT or VS2. It requires less than 30K bytes of memory and costs $11,175; Quicktab costs $10,900, CACI said from 1920 Association Drive, Reston, Va. 22091.

'Progeni' Eases Cobol Coding

GLENDALE, Calif. — Described briefly as a Cobol precompiler, Progeni is a comprehensive tool that includes function modules, decision table handling, Cobol formatting, pattern replacements, tracing and documentation, according to a spokesman at Progeni Systems, Inc., the U.S. offshoot of the Australian firm that developed the software.

Progeni is written in Cobol and is presently available for users of Burroughs Corp. medium-scale systems with a version for large-scale systems likely by year-end.

The software relies heavily on the use of macro instructions to get programs coded quickly but completely; entire logical functions, built into the macro code, are tuned to the users' needs through the use of parameter entries, the spokesman explained.

The basic Progeni system provides macro expansion, repositioning of code and source collation. In addition, it includes all the programs needed to maintain the macro library, he said, adding that macros are supplied for file handling and program documentation.

The basic Progeni, a skeleton Cobol program, includes all required division, section and paragraph headings. A number of standard positions are also defined into which the programmer can place appropriate code, the spokesman continued.

The file-handling macros reportedly includes support for Isam or index-random data structures.

The complete Progeni system performs all the basic functions and includes the alteration and replacement of Cobol constructs for machine-dependent code; support for insertion of decision tables subsequently converted to Cobol through macros; and reformatting of output.

The basic implementation needs 33K bytes of memory and costs $10,500 or $600/mo. Individual extensions range from $1,000 to $2,500, the firm said from 715 N. Central Ave., Glendale, Calif. 91203.

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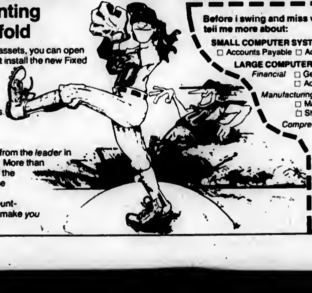

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Package Helps Manufacturer Manage Growth

Charles Wart checks a stock status report produced by the B80.

SYRACUSE, N.Y. — Both the volume of business and the number of employees have tripled in the past nine years at Babbitt Bearings, a manufacturer of bearings for turbines, compressors and oil field equipment here. The future looks bright for the 33-year-old privately held company, and DP is playing a part in that prospect.

"Even though we're a small company, our biggest problem is controlling our growth," according to vice-president Charles (Chuck) Wart. "One of the hazards of rapid growth is the proliferation of paperwork and the eventual inability to control production by manual methods. We recognized the need for automation and found the solution in a small business system and an off-the-shelf software system."

Babbitt Bearings is essentially a service organization "because we custom-manufacture all of our products to customer specifications and drawings," Wart explained. "One of the primary reasons for our success is that we are large enough to give quick turnaround on most orders, yet we're small enough to add the personal touch and answer customer questions about the status of their orders. Of course, as our volume grew, it became more difficult to answer those questions."

The ability to turn orders around results partly from a limited interchangeability of parts. The bearings are assemblies made up of several parts, such as base rings, shoes and keys. If it is anticipated that a particular size of key or shoe being made for one customer's order will be needed for another order in the near future, the shop will make up extras and stock them as inventory.

On orders expected to be repetitive, Wart will anticipate the customer's needs and build extras for stock. "This is really a guessing game," he said, "because the bearings are specifically made for that one customer. If it doesn't order them, we don't sell them. But we've been pretty accurate in our guesses so far."

Several years ago, before installing the small B80 computer and the Production Control System (PCS) programs from Burroughs Corp., the company developed a manual system to help control the entry of jobs into the plant and workflow through the shop. "It was a good system for us as we were developing," Wart said, "because it let us do things in an orderly manner. But there were several disadvantages to it as we grew. It took almost all of two people's time to manage it, and there was a lot of duplication of effort.

"We knew it was just a matter of time before we would have to automate our production control somehow," he recalled. "We knew we had all the pieces of a good system in our manual method, but putting them all together was the biggest problem we had. We just didn't have the time or manpower to do it."

'Astonishing Parallel'

Office manager John Cerrone provided the initial input that led to automation. "I went to a seminar at the local Burroughs branch where the PCS software was discussed," Cerrone said. "The parallel between PCS and our manual system was almost astonishing.

"It seemed as if Burroughs was talking about using the elements of our manual system on a computer. Not only was the software attractive to us, but the B80, which was demonstrated, was very affordable, even for a relatively small company like ours."

After Wart saw the equipment in operation, the decision was made to install a B80 and the PCS software. "PCS now is bringing all the pieces together and giving us a much better picture about our company operations than we ever had before," Wart said.

PCS consists of four modules that perform separate and distinct functions while interacting with each other. The two key modules for early installation are the bill of material and work center routing modules. These contain the working files from which the processing for the system is done: the item master, product structure, work center and routing files.

After the files are built, the stock status and costing modules, which are processing modules for inventory con-

(Continued on Page 35)

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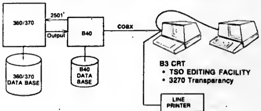

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MTS Eased

CHESTNUT HILL, Mass. — CFSMTS from CFS, Inc. is a DOS/VS enhancement that reportedly relieves the contention that can occur with the use of IBM's Multiple Transient System (MTS) feature.

CFSMTS provides a unique Logical Transient Area (LTA) for each problem program partition as well as a separate LTA for the Attention Routines. This means each program can concurrently execute code that requires use of the LTA, a spokesman explained.

The package provides a dynamic classification facility to control concurrent usage of $$B transients that are dependent on a single resource, but the user may also classify his own or any other transients, she added.

CFSMTS costs $4,275, $130/mo or $1,425/year from CFS at Suite 608, 1330 Bolyston St., Chestnut Hill, Mass. 02167.

For PDP-11 Users

Enhanced 'Runoff' Polishes Text

APPLETON, Wis. — Users of Digital Equipment Corp. PDP-11s running under RSTS/E or RT-11 can gain rapid, versatile text formatting capabilities for reports, manuscripts and manuals printed from typescript by utilizing the Lawrence Runoff V01.00 now available from Lawrence University, a spokesman claimed.

The Ascii text files required as input to Runoff may be prepared using any text editor, he said, adding that special commands, positioned throughout the source text submitted to Runoff, permit the user more options than normally available.

Principal effects available through these commands include pagination, centering, tabulation, paragraphing, line filling and justification, he explained. Footnote processing, indexing and hyphenation are also provided, he noted.

The output from Runoff can be directed to an on-line terminal device or onto disk or tape for later printing and permanent reference.

Once processed, the text can be disregarded if error messages show it to be flawed. Printing of the output can be started at any page, he said, allowing a quick check of a change — for example — before starting the full production run of the output.

Coded in Macro-11, the software from Lawrence is said to outperform comparable DEC-supplied utility. Specifically, it runs faster, uses less space and requires less overhead, the spokesman said.

In one case, he claimed, the DEC-supplied software output 2 page/min; Lawrence's Runoff did the job at 69 page/min.

Ready now for licensed distribution, the Lawrence Runoff varies in price according to the type of user installation. Educational installations can have it for $200; nonprofit organizations will pay $300 while commercial users will find $500 price tags, the spokesman added from Computer Center Publications, Lawrence University, Appleton, Wis. 54912.

B80 and 'PCS' Manage Growth

(Continued from Page 34)

trol and cost control, can interact and even update the master files. For instance, the costing module contains a program to update the item master file with new cost figures based on shop time cards.

At the same time, the module prints out a complete costing report by part number and cost center.

PCS was relatively easy to install, Wart said, because Babbitt Bearings already had the nearly parallel manual system operating. Shop time cards, the data source for much of the cost information, for example, were already accepted and in use.

Further, most of the data for the item master, product structure, work center, routing and rate files already existed in written form.

The master file included some 2,500 to 3,000 items consisting of bills of material for more than 1,000 different part numbers, subassemblies and raw materials listings. Any subassemblies already produced for stock also were included in the inventory listings and cross-indexed with any finished bearings in which they could be used.

The immediate effects of the system were that duplication of effort was eliminated, and management immediately got better control of production flow, Wart said.

Repeat Orders

Martha Wood, who originally did the clerical work with the manual system, was designated as the computer operator. "Each time an order comes in, I just key it in and the computer does the rest," she said.

"For example, if there is a repeat order for an existing part number, the B80 automatically prints out the bill of materials, checks to see if we have any components or subassemblies in stock and reserves the raw materials from our steel inventory or notifies us that it is not in stock and that we have to order.

"This has freed the draftsman's time to do more drafting, and it gets the order into the system in a fraction of the time it used to take," she said.

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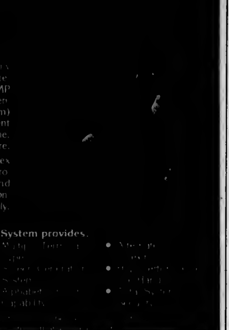

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Switch From In-House Gear To Service 'Great': User

LOS ANGELES — Southwestern Engineering is a manufacturer of large feedwater heaters, nuclear steam generators and steam condensers. Until two years ago, the company had a large in-house computer that proved unsatisfactory for a variety of reasons.

"The costs were getting out of hand, for one thing," Larry Harma, Southwestern's controller, remembered. "Also, we needed an effective job cost forecasting system. We have to know where every one of our jobs will be 12 to 16 weeks in the future.

"In our kind of manufacturing, our profits can be eaten up by things like labor, burden, production costs — and hefty computer costs every month. For us, the answer has been the on-line system offered by a remote computing service vendor. It's given us just what we needed, and it's even cut our DP costs by roughly $16,000 a month."

Once the decision to replace the in-house system was made, the search quickly narrowed down to a turnkey minicomputer system and Xerox Computer Services (XCS).

"The mini looked good at first. It certainly looked cheaper than everybody else. Then we took a closer look.

"The mini would require extensive programming but XCS could get us on-line almost immediately," Harma continued. "The mini hardware would have to be upgraded to meet our requirements; with the XCS system, we'd only need terminals to access its big computers.

"What convinced us to go with XCS, though, was the mini manufacturer's reluctance to guarantee the performance of its product's software. XCS made that guarantee, and it's lived up to it."

Painless Conversion

The conversion of Southwestern Engineering's DP operation to the XCS system was virtually painless, Harma said. Accounts receivable and payable were up and running in 10 days.

Other critical applications such as general ledger, inventory control, labor efficiency and job costing soon followed. Total conversion to the XCS system took just 41 days.

One of the key benefits of XCS for manufacturers like Southwestern according to Harma, "is that we're able to enter today's data such as payroll or work-in-process into the system and have it automatically update all the other files immediately.

"I really thought an on-line, integrated system would cost us a lot more than it does. XCS isn't cheap, but it's sure reasonable. Especially when you compare what we're paying — under $100,000 a year — with what we were paying when we had our own mainframe: roughly $300,000.

"And we were even able to get rid of a trailer we were leasing (for $500 a month) as office space and move our people into the space formerly occupied by our in-house system."

In the job costing area, Harma believes the XCS system is especially effective. "Before, we'd have to cost our jobs by hand-gathering literally hundreds of work orders and then trying to figure out what it all meant. You can imagine how accurate our forecasting and costing were.

"Now we're able to subdivide all our manufacturing jobs by individual work orders in each department. It comes to between 50 and 60 work orders per job. And all that data is current.

"It's great to be able to look at every single job in the plant at any stage and know exactly how we're performing and what each of our products costs us to make before it's shipped.

"That kind of job-costing information plus the great cost savings has really made the difference for us."

System Supports Interdata Users

SUNNYVALE, Calif. — System 9000, available now from California Computer Distributors, Inc. (CCD), has been described as an integrated software system for use on Interdata's 16-bit minicomputers.

The package is said to include a multiuser time-sharing operating system, an extended implementation of Basic, system utility programs and, optionally, a series of business application programs.

The time-sharing support operates in a Basic environment with up to 32 users while maintaining a large user work area, CCD said.

Called Virtual Basic, the System 9000 implementation goes beyond Interdata's Extended Basic and is optimized for speed, efficiency and commercial applications, a spokesman claimed. It supports those who want to do their own programming, he noted.

The business applications package includes general ledger, accounts payable, accounts receivable and word processing facilities. The accounting subsystems feed into the general ledger and all systems provide audit trails.

The entire accounting system was designed to adapt easily to the user's current bookkeeping methods, the spokesman said. The word processing system, as most, includes both editing and storage support for a variety of documents.

The primary software system costs $5,990; the business applications can be included for an additional $3,990. More applications are expected before the end of the year, the spokesman said from 1265 Reamwood Drive, P.O. Box 60428, Sunnyvale, Calif. 94088.

ACM Education Unit Asks Participation

NEW YORK — The chairman of the recently formed Elementary and Secondary Schools Subcommittee of the Association for Computing Machinery's (ACM) Curriculum Committee is seeking participants to help guide the study of an instructional use of computers at the school level.

David Mousund said he'd like to hear from even those only passively interested in the project, but especially those who want to take a more active role in the committee's work.

Mousund can be reached at the Department of Computer Science, University of Oregon, Eugene, Ore. 97403.

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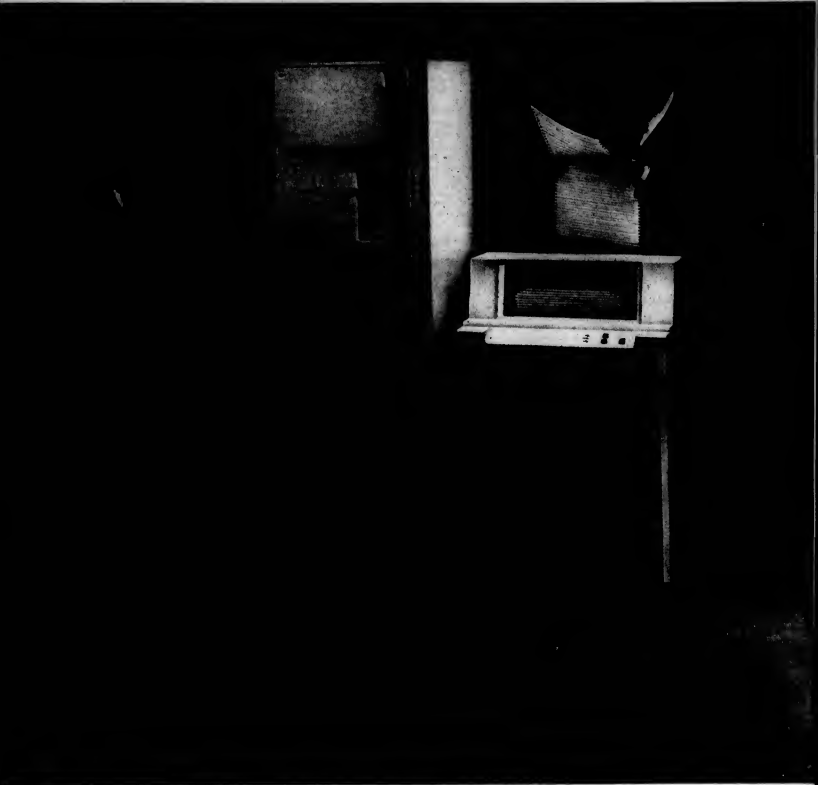

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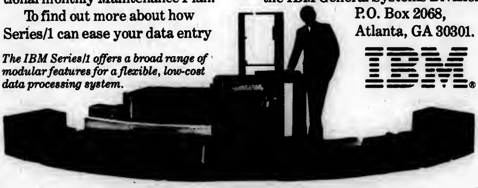

The IBM Series/1 offers a broad range of modular features for a flexible, low-cost data processing system.

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Query Package Moves

WOODLAND HILLS, Calif. — Developed by CGA Computer Associates, Inc., the In?uiry/IMS interactive query system for use under IBM's IMS or DL/1 data base management environments is now being marketed, supported and enhanced by Informatics, Inc.

The package provides a natural language facility and operates on any terminal supported by IMS or the Time Sharing Option (TSO). It allows for searching of physical, logical and multiple data bases to satisfy user requests.

In?uiry/IMS also provides arithmetic capability, on- and off-line sorting, support for cataloging and later invocation of frequently used routines and backing for MFS, Informatics said from 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Isam Logic, Disk Space Control Included in Micro-Based Pascal/Q

BERKELEY, Calif. — Pascal/Q, a software system intended for use on 8080 and Z80 microcomputers, is based on work done by the Institute for Information Systems at the University of California at San Diego, according to a spokesman for the vendor, Queue Computer Corp.

The updated Pascal includes support for Qsam, Queue's enhanced Isam file access method, and for automatic disk file storage allocation, the spokesman noted.

Current versions of Pascal/Q are designed for Mits/Altair, Icom and Intel floppy disk systems and Mits/Altair cartridge disk systems, he added.

Although many software houses provide maintenance of their products, Queue believes its Monthly Update Service is unique. Every service subscriber receives a diskette each month that contains both the latest software updates and a newsletter.

Utilities, Too

By executing the update program also carried on the diskette, the user has a system that is updated.

In addition, the update service enables Queue to distribute newly developed utility programs and general information on Pascal/Q.

A 30-year user license for Pascal/Q costs $300 plus $19/mo for the update service, the spokesman noted from 1044 University Ave., Berkeley, Calif. 94710.

NCR 'Scholars II' Aids Compliance With U.S. Rules

DAYTON, Ohio — An enhanced version of the NCR Corp. School Automated Records System (Scholars) is said to provide users enough support to comply fully with the U.S. Office of Education's Handbook II (Revised Recommendations), which establishes guidelines for recordkeeping.

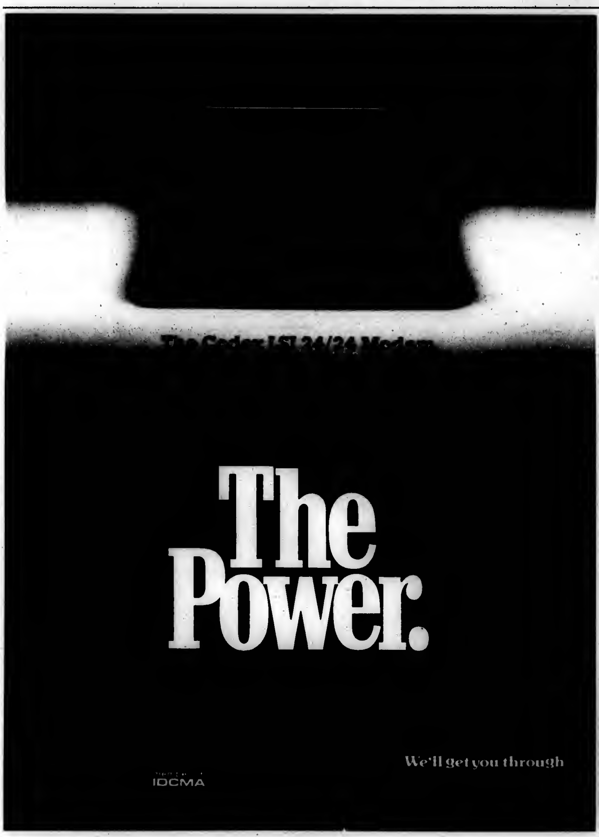
The original Scholars applications includes a student scheduling module, a student attendance reporting module, a student grade reporting module, a student test evaluation module, an academic history module and a mark sense optical scanning capability.

In addition, Scholars includes control and data base management modules used by the application modules.

Scholars II includes all these features plus an expanded student information application — for the Handbook compliance.

A generalized report writer can be used to build the reporting portion of the student personnel system without programming.

Scholars II, which is available now, can be used with an NCR Century or 48K-byte N-8400 or larger system. The software can be acquired for $9,400 (plus $500/year for maintenance) or $300/mo.



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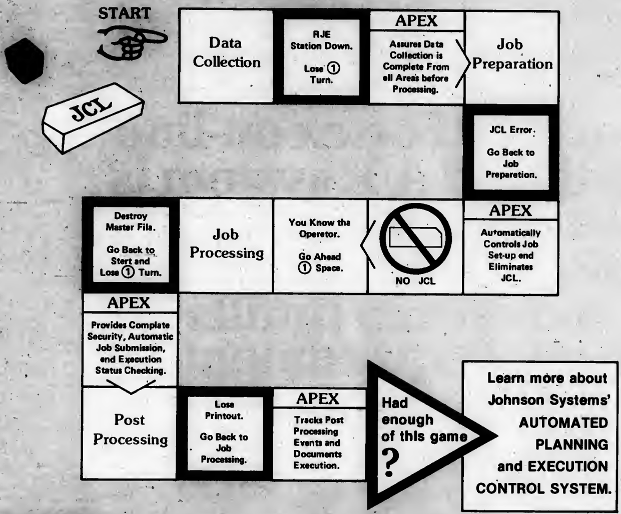

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Data Base/Practical Issues — Part 3

High-Level Options Simplify Application Logic

By Robert E. Roach
Special to CW

The first of these articles demonstrated the advantage of organizing data base files into a relational network rather than a hierarchy [CW, Sept. 11]; the second described a data base organized by means of utility files and application reporting files [Sept. 18].

An important question remains to be answered. How can we get the greatest value from a data base system with the minimum programming effort?

One answer to this question has already been implied: data independence will reduce reprogramming requirements as the data base evolves.

Another answer is to use higher level languages.

Today there are several significant types of higher level languages used with data base systems. These range from a basic query language like Software AG's Adascript and a "fill-in-the-worksheet" language like Informatics, Inc.'s Mark IV to a nonprocedural language like Mathematica, Inc.'s Ramis II.

The most important of these is the nonprocedural language. What exactly does "nonprocedural" mean?

In traditional lower level languages (such as assemblers and compilers), you have to write detailed logic or algorithms specifying *how* to do the work to produce the desired results. Procedural language programs usually are difficult to follow unless you have written them yourself.

What Is Required

Nonprocedural languages, on the other hand, do not require logic specifying how to accomplish the work. Rather, they simply follow English patterns of speech to specify *what* is required.

A nonprocedural language should have the following attributes:

- A syntax that is natural to the language of the application problem.
- A syntax that permits a free-format English language formulation of diverse application problems.
- The production of identical results for a given *logical* relationship of data — without regard to the *physical* structure, networking or ordering of data. In other words, the language must be data-independent.

Four-Phased Usefulness

A nonprocedural language is useful in four distinct phases of system development.

First, it can be used to define all of the files and relationships in the data base. A by-product of this phase is that a file dictionary is automatically made available.

Secondly, it can be used for records management. Data may be captured through batch or on-line programs, edited and validated, then loaded into the data base files.

Third — and perhaps the most useful — is report generation. Reports may be produced consisting of the file dictionary, of lists, of groupings that are subtotaled, of complex calculations, of selection criteria and so forth.

Frequently run reports can be saved (or cataloged) and executed upon demand.

Ad hoc reports can be defined and run as needed. In this environment, the user can define trial reports or solutions to problems and see the results immediately, not when the Cobol programming shop gets around to it six months later.

Fourth, file extracts can be made and data which has been prepared for reports can be

(Continued on Page 44)

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General Credit Manager
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Sequential, Direct Access Supported by Univac Basic

BLUE BELL, Pa. — Introduced by Univac for users of its smaller 90 series CPUs under OS/3, the Extended Basic compiler includes support for sequential and direct files, according to a spokesman.

Described as highly compatible with the Dartmouth College Basic System, the compiler also supports formatted printing, subprograms — including library subprograms — program segmentation and control mechanisms such as time limits for executing programs.

Execution of programs stored on disk has been added with the OS/3 Extended Basic, as have "several intrinsic functions," improved stirng support, matrix arithmetic and "I/O," the spokesman added.

The updated compiler is upward-compatible with Univac's earlier language facilities. Existing 90/25, 90/30 and 90/40 Basic programs can be compiled and executed under the Extended Basic without recoding, he said.

One of the features of the compiler is the availability of the Dartmouth College Basic library of application programs. This library includes more than 900 programs which are operational on the college's facilities in New Hampshire.

The library programs can be ordered from the Kiewit Computing Center in Hanover, N.H., or from Univac. A Univac spokesman said he believed there would be no charge for the library program requested through his firm.

Many of the library programs can be used on the Univac 90s with "little or no change"; others require more extensive changes before they can be used on the Univac equipment.

The Extended Basic compiler costs $60/mo. It requires Univac's Basic Edit Monitor, which costs an additional $75/mo, the spokesman acknowledged.

Micro Compiler Gets Price Cut

AMES, Iowa — Compas Microsystems has announced a 50% price reduction in its mid-level implementation language package designed for Rockwell International, Synertek, Inc., and MOS Technology, Inc. 6500-based microcomputer systems.

CSL/65 is said to be similar to PL/I or Algol and is structured to produce assembler code instead of object code. The language package is available in versions compatible with Rockwell's System 65 development systems or Digital Equipment Corp.'s PDP-11 minicomputer running under RT-11 operating system, a spokesman stated.

The System 65 version of the language is functionally identical to Rockwell's recently introduced PL/65, the spokesman added.

The CSL/65 compiler now sells for $500; the PDP-11 version is priced at $600 from Compas at 413 Kellogg, Ames, Iowa 50010.

Forecasting Topic Of One-Day Course

FAIRFIELD, N.J. — A one-day seminar, "Forecasting Techniques for Management," will be presented in Philadelphia next week and in New York and then San Francisco in November, according to its sponsor, Rapidata, Inc., a nationwide remote computer service specializing in financial applications.

The seminar will be led by Robert L. McLaughlin, president of Micrometrics, Inc., a Connecticut-based consulting firm.

The Philadelphia presentation is scheduled for Tuesday, Sept. 26, at the Girard Bank offices at 3 Girard Plaza.

The enrollment fee for each of the presentations is $125 per participant, Rapidata said from 20 New Dutch Lane, Fairfield, N.J. 07006.

Pay-by-Phone Plans Paced

SEATTLE — The major obstacles faced by financial institutions in launching an effective telephone bill payment (TBP) service are said to be addressed by a marketing support package now available from Telephone Computing Service Inc. (TCS), the vendor of the Pay-by-Phone system.

In addition to providing the use of the Pay-by-Phone name and logo, the package shows how to conduct detailed financial analysis used for decision making and planning. The analysis projects the performance of the user's TBP system over five years for planning personnel requirements, service hours, pricing and return on investment, according to a spokesman.

Although the support package is oriented toward Pay-by-Phone and users can credit the package's cost toward the cost of a turnkey system from TCS, the information provided could also be helpful to institutions writing their own software and establishing their own TBP system, the spokesman emphasized.

More direct support — on-site consultation, merchant solicitation and customer sign-up training by TCS staffers as well as copies of radio and TV ads used by TCS Pay-by-Phone licensees — is part of the package, he said.

The cost of the package varies with the amount of support provided, TCS said from 1115 Eastlake Ave. East, Seattle, Wash. 98109.

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— Paul G. Zurkowski

Technology and the Company Organization
- System Development
- Data Processing Operations
- The Office Environment
- Organizational Relationships
- Panel Discussion

Wednesday, Nov. 29
Managing the Total Information Resource
- Technical Requirements
- Information Resources Management
- Planning Future Resource Needs

Luncheon Address
- The Challenge of Systems Management in the Eighties
— John Gosden

Making the Transition to the Eighties
- Controlling Information Processing Costs
- Security and Accounting Processing Costs
- Enhancing the Productivity of Men and Machines
- Software Packages and Implementation Aids
- Panel Discussion

Thursday, Nov. 30
Parallel Workshops
(conducted twice, select two)
- **Strategic Planning: Concepts and Experiences**
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- **The Automated Office**
- **Selecting High Payoff Projects**
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Packages Aid DG Users

NEW YORK — A report writer and a file management system from Advanced Computer Techniques Corp. both interface with Fortran and Assembly language programs and were designed to operate with Data General Corp. Eclipse and Nova systems.

The report writer operates as a stand-alone utility and provides automatic report formatting and printing in 5K words of memory, a spokesman explained. The system includes default report format options and selective record printing as well as carriage control.

The file management system requires 2K words of memory and can be accessed either keyed or sequentially in a multiuser environment, according to the spokesman. Records can be retrieved by generic or approximate keys; the system handles its own file maintenance, including file creation, deletion and reorganization.

The report writer and file management packages cost $4,000 and $5,000, respectively, the firm said from 437 Madison Ave., New York, N.Y. 10022.

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Business-Oriented Facilities

'Selector II' Ready for Micros

DUBLIN, Calif. — Selector II was developed to give the microcomputer user many of the business-oriented facilities already generally available to minicomputer and full-scale computer users, according to Selector's vendor, Micro-Ap.

The software includes a file manager that maintains pointer lists to relative records within random-access files. This indexed sequential facility is unique, a spokesman claimed, because it dynamically allocates space only as it is needed.

It also allows duplicate keys and is typically able to retrieve the lowest record with a key from a 1,000-record file within 5 sec, the spokesman continued.

Selector II is also a query language with an internal sort capability, linking to a report generator that Micro-Ap described as similar in function but easier to use than Digital Equipment Corp.'s Datatrieve 11 software.

Query report criteria are spelled out in Selector II commands; the system allows as many as 10 command sets to be stored for each file so production work can be set in motion by invoking the name of the stored command string.

The software requires 48K bytes of memory to operate. It is available in Microsoft Extended Disk Basic, operating under CP/M or compatible systems, and in CBasic, also under CP/M.

The source code for either is included in its own diskette. It is also available on 5-in. CP/M-compatible diskettes for Northstar or Micropolis minifloppy use, the spokesman noted.

The software costs $255 with a user's manual available for $25, Micro-Ap noted from 8939 San Ramon Road, Dublin, Calif. 94566.

Language Choices Ease Coding for Data Base Use

(Continued from Page 42)

temporarily held for further processing, such as the production of graphs.

In addition to the higher level language, data base systems provide for procedural language programming. The procedural language program is typically a Cobol, PL/I or Fortran program and uses a set of subroutines to access the data base.

These subroutines perform such functions as getting the next record, jumping to the next branch of the subtree, locating a record based on keys and updating a record segment.

Nonprocedural Preferable

When should you use the nonprocedural language and when should you write procedural language programs? In general, nonprocedural languages should be used whenever possible.

Studies have shown that these languages can increase programmer productivity fivefold. There can be no doubt that nonprocedural language programs are preferable for ad hoc reporting.

For standard production reports, the choice is not always so easy. As a matter of fact, most reports can actually be done satisfactorily with nonprocedural programming with only a fraction of the usual coding.

In some instances, however, the cosmetics of the report or a complex calculation will require procedural language programming.

As nonprocedural languages have matured, they have incorporated more cosmetic and complex calculation features. The result is that programs which formerly had to be coded in a procedural language can now be done in the nonprocedural language.

As a project goes through a development cycle, the reports frequently will progress through several stages. At first, the reports are poorly defined: trial ad hoc reports are done.

When the reports become well-defined, standardized nonprocedural reports are written and cataloged.

Finally, if the situation calls for it, they may be rewritten in a procedural language using a nonprocedural data base access. The result is that an appropriate amount of programming effort is expended at each stage, providing more timely reports with less effort.

Roach is a senior consultant for Mathematica Products Group, Inc.

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Martin Predicts More Features

AT&T Uncovering ACS 'a Bit at a Time'

By Ronald A. Frank
CW Staff

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Most users have not yet realized how ambitious ACS really is, since any applications that can be implemented in distributed intelligence systems are compatible with ACS, Martin said during a recent interview.

AT&T is really taking the cover off ACS "a bit at a time," Martin said, adding that ultimately the telephone company will provide storage of user applications programs at central office ACS faciliteis.

Asked what types of added-value features would be introduced as part of ACS, Martin referred to his latest book called *A Special Report on Computer Networks and Distributed Processing.*

Included in this work is a description of "Layer 4 [applications dependent] software," which he believes will be introduced for the Bell service. Such functions as assistance in establishing a network session; basic networking functions such as converting high-level statements into packets and protocols; application macroinstructions to provide remote/local software transparency; program control facilities for downline loading and execution of programs and similar functions are included in this type of software.

Other potential ACS capabilities would include file access functions, recovery and error control; editing and translation to provide code conversion; "dialogue software" for data base inquiries and similar terminal operations; vitual terminal transparency; code conversion and compaction; payment functions for billing; and security and audit functions, he said.

Impact on Overseas Carriers

In addition to providing users with many desired features, ACS will have an impact on overseas common carriers now implementing public data nets such as Transpac in France, Datapac in Canada, EPSS in Britain and Euronet in Western Europe. None of these are "as rich a concept" as ACS, and keeping up with the proposed Bell capabilities will pose a challenge to the carriers and the Consultative Commitee on International Telephone and Telegraph (CCITT), which will have to formuate the necessary standards, Martin explained.

In this country, ACS, if allowed to operate with regulatory approval, will impact distributed DP nets such as those provided by Four-Phase Systems, Inc. and the Datapoint Corp. ARC System. In effect, full implementation of ACS will turn the Bell System into a time-sharing vendor, Martin predicted.

The DP system vendors will also be affected and the network architectures available from the CPU vendors will be modified to become ACS-compatible, he said. The DP vendors will fight to block ACS but this kind of competition is good for the user. However, it would be bad for U.S. users if ACS does not gain regulatory approval and has to be postponed, he said.

As a side effect, ACS will make the value-added carriers such as Telenet and Tymnet grow. The AT&T announcement is actually saying that there is a "tremendous opportunity here for anyone who wants to provide these type of services," he said.

Asked whether AT&T would be able to implement ACS with in-house talent, Martin said it is possible it will draw on the capabilities of the DP industry. But this is not certian. "AT&T has its best manpower working

(Continued on Page 46)

Too Much Deregulation Could Cut Carrier Usefulness: Bell

WASHINGTON, D.C. — Deregulation of all but the most basic communications functions is "unnecessary and inappropriate" for bringing about a resolution of the second computer inquiry, according to F.T. Julian, director of data and telecommunications policies and planning at AT&T.

Speaking at the Compcon '78 conference sponsored here recently by the IEEE Computer Society, Julian said too much deregulation is not in the public interest because it could eliminate or reduce the usefulness of "certain carrier services.

"An overly broad definition of unregulated data processing would serve no purpose other than to limit the Bell System's participation should the 1956 Consent Decree preclude the Bell System from providing an unregulated service," he said.

Saying that there has been misunderstanding on this point, Julian maintained there is no compelling reason why two competing services — one regulated and the other unregulated — cannot be provided to meet the same set of user needs.

Federal Communications Commission (FCC) regulation of a Bell System communications service is "no cause for other vendors to fear the extension of regulation to their own services. The fact that the Dataspeed 40/4 has been tariffed as part of a communications service has in no way subjected similar terminals provided by others to regulation," he said.

Existing regulatory controls in the form of improved cost accounting systems can prevent potential abuses in cross-subsidization of competitive services with revenues from other services, he noted.

Speaking at the same session, Walter Hinchman, recently chief of the FCC's Common Carrier Bureau and now an independent consultant, said it would be best if the commission did not rule on AT&T's Advanced Communications Service (ACS) until more cost data is made available as part of a full 214 application.

The FCC made a decision on Bell's Dataphone Digital Service (DDS) without enough cost data and it later had problems because of it. For this reason, the commission should ask for additional cost information on ACS, he said.

Turning to the Congressional effort to rewrite the Communications Act, Hinchman questioned whether a "one-shot legislative solution can handle the many problems." There is no single point solution and the best approach would be to modify the existing Communications Act, he said.

CMA Meet Near

ARDSLEY, N.Y. — The Communications Managers Association (CMA) will hold its annual conference and exhibition Oct. 17-19 at the Rye Town Hilton Inn in Port Chester, N.Y.

Keynote speaker will be Thomas Bolger, executive vice-president of AT&T. Other speakers will include communications consultants Howard Anderson of the Yankee Group, Howard Frank of Network Analysis Corp. and Richard Kuehn of RAK Associates.

Topics to be discussed include AT&T's Advanced Communications Service, the rewrite of the Communications Act, telecommunications staffing problems, IBM's Synchronous Data Link Control and other subjects of interest to telecommunications managers.

Information about the conference and exhibition is available from Charles Schweis, first vice-president of CMA, Ciba-Geigy corp., 444 Saw Mill River Road, Ardsley, N.Y. 10502.

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In addition to providing users with many desired features, ACS will have an impact on overseas common carriers now implementing public data nets such as Transpac in France, Datapac in Canada, EPSS in Britain and Euronet in Western Europe. None of these are "as rich a concept" as ACS, and keeping up with the proposed Bell capabilities will pose a challenge to the carriers and the Consultative Commitee on International Telephone and Telegraph (CCITT), which will have to formuate the necessary standards, Martin explained.

In this country, ACS, if allowed to operate with regulatory approval, will impact distributed DP nets such as those provided by Four-Phase Systems, Inc. and the Datapoint Corp. ARC System. In effect, full implementation of ACS will turn the Bell System into a time-sharing vendor, Martin predicted.

The DP system vendors will also be affected and the network architectures available from the CPU vendors will be modified to become ACS-compatible, he said. The DP vendors will fight to block ACS but this kind of competition is good for the user. However, it would be bad for U.S. users if ACS does not gain regulatory approval and has to be postponed, he said.

As a side effect, ACS will make the value-added carriers such as Telenet and Tymnet grow. The AT&T announcement is actually saying that there is a "tremendous opportunity here for anyone who wants to provide these type of services," he said.

Asked whether AT&T would be able to implement ACS with in-house talent, Martin said it is possible it will draw on the capabilities of the DP industry. But this is not certian. "AT&T has its best manpower working

(Continued on Page 46)

Too Much Deregulation Could Cut Carrier Usefulness: Bell

WASHINGTON, D.C. — Deregulation of all but the most basic communications functions is "unnecessary and inappropriate" for bringing about a resolution of the second computer inquiry, according to F.T. Julian, director of data and telecommunications policies and planning at AT&T.

Speaking at the Compcon '78 conference sponsored here recently by the IEEE Computer Society, Julian said too much deregulation is not in the public interest because it could eliminate or reduce the usefulness of "certain carrier services.

"An overly broad definition of unregulated data processing would serve no purpose other than to limit the Bell System's participation should the 1956 Consent Decree preclude the Bell System from providing an unregulated service," he said.

Saying that there has been misunderstanding on this point, Julian maintained there is no compelling reason why two competing services — one regulated and the other unregulated — cannot be provided to meet the same set of user needs.

Federal Communications Commission (FCC) regulation of a Bell System communications service is "no cause for other vendors to fear the extension of regulation to their own services. The fact that the Dataspeed 40/4 has been tariffed as part of a communications service has in no way subjected similar terminals provided by others to regulation," he said.

Existing regulatory controls in the form of improved cost accounting systems can prevent potential abuses in cross-subsidization of competitive services with revenues from other services, he noted.

Speaking at the same session, Walter Hinchman, recently chief of the FCC's Common Carrier Bureau and now an independent consultant, said it would be best if the commission did not rule on AT&T's Advanced Communications Service (ACS) until more cost data is made available as part of a full 214 application.

The FCC made a decision on Bell's Dataphone Digital Service (DDS) without enough cost data and it later had problems because of it. For this reason, the commission should ask for additional cost information on ACS, he said.

Turning to the Congressional effort to rewrite the Communications Act, Hinchman questioned whether a "one-shot legislative solution can handle the many problems." There is no single point solution and the best approach would be to modify the existing Communications Act, he said.

CMA Meet Near

ARDSLEY, N.Y. — The Communications Managers Association (CMA) will hold its annual conference and exhibition Oct. 17-19 at the Rye Town Hilton Inn in Port Chester, N.Y.

Keynote speaker will be Thomas Bolger, executive vice-president of AT&T. Other speakers will include communications consultants Howard Anderson of the Yankee Group, Howard Frank of Network Analysis Corp. and Richard Kuehn of RAK Associates.

Topics to be discussed include AT&T's Advanced Communications Service, the rewrite of the Communications Act, telecommunications staffing problems, IBM's Synchronous Data Link Control and other subjects of interest to telecommunications managers.

Information about the conference and exhibition is available from Charles Schweis, first vice-president of CMA, Ciba-Geigy corp., 444 Saw Mill River Road, Ardsley, N.Y. 10502.

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Government Seminar Slated

ST. LOUIS — Those interested in the management of federal telecommunications resources are invited to the First National Government Telecommunications Seminar and Exposition to be held here Oct. 4-6.

Representatives of various federal government agencies will address such topics as the roles of the Office of Management and Budget and the General Services Administration in determining telecommunications policy, the regulatory role of the new National Telecommunications and Information Administration, user experiences at the Department of federal communications standards.

Featured seminars will discuss fiber optics, satellite communications, data communications for executives and packet switching.

Sponsored by the Midwest Federal Telecommunications Forum and the ADP Council of the Southeastern States, the activities will be held at the Chase-Park Plaza Hotel here.

A fee of $50 covers registration for all events and most meals.

Fees and confirmations of attendance should be sent to the Midwest Federal Telecommunications Forum, 1500 E. Bannister Road, Kansas City, Mo. 64131. Additional Information is available from the Forum or the ADP Council at Room 512, 1776 Peachtree Street, N.W., Atlanta, Ga. 30309.

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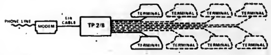

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Megadata Workstation Suits On-Line, Stand-Alone Uses

BOHEMIA, N.Y. — Megadata Corp.'s Model 2001 communications workstation is intended for telecommunications or stand-alone word processing.

The standard Model 2001 configuration includes a CRT terminal, dual floppy disk and printer. The user can develop programs on the system by employing a language furnished for this purpose.

Alternatively, Megadata can design software to user specifications for system operation by personnel "trained only in basic secretarial skills."

The CRT terminal features up to 64K words of programmable read-only memory (Prom), a Megadata source said. The 15-in. diagonal terminal screen accommodates 20 lines of 80 characters each, using an 8 by 12 dot matrix for each character.

Each Model 2001 system features a fixed character set of 128 characters preprogrammed into the Prom, the source continued. However, a random-access memory character generator is available that allows the terminal to acquire its character set from the floppy disk, expediting multilingual uses.

Other system features include variable page length, variable line spacing within a page, variable left- and right-hand margins within a page, variable tabs by line or page, automatic centering of data, multiple indentation, automatic super- and subscripting and simultaneous playout and record.

The communications protocols offered with the system include IBM 3270, 2260 and 2740; Univac U200 and 100; VIP 7700; and Hazeltine Corp. 2000.

The Model 2001 costs $12,500 to $18,000, depending on the configuration ordered, Megadata said from 35 Orville Drive, Bohemia, N.Y. 11716.

Full-Duplex Comdata Unit Functions With 113B, 212A

SKOKIE, Ill. — Comdata Corp. has unveiled the T212A modem which provides full-duplex operation over the public dial-up network in the low (0- to 300 bit/sec) and medium (1,200 bit/sec) speed range.

The modem is Bell 113B and 212A-compatible and offers such standard features as LSI circuitry, manual speed selection for originating modem, automatic speed adjustment by answering modem, EIA digital interface, Federal Communications Commision (FCC)-certified telephone line interface, visual diagnostic indicators and configuration flexibility.

Data calls may be manually originated via a telephone handset equipped with an exclusion key (models 503 or 565) or via an automatic dialer. Incoming calls may also be answered manually or automatically, Comdata said.

Calls may be terminated manually via the handset or automatically by a steady space signal, loss of carrier or a power down of the associated terminal. Four test switches used in conjunction with the diagnostic indicators allow for rapid isolation of system malfunctions, according to the firm.

For maximum cost effectiveness, the T212A is provided in a variety of configurations: compact stand-alone units provide single-terminal installations, while the rack-mount version is said to be an economical solution for the time-sharing installation.

The stand-alone version costs $895, the rack-mount modems are $775 each and the housing which accommodates eight modems costs $750.

Comdata is at 8115 N. Monticello, Skokie, Ill. 60076.

More ACS Features Coming

(Continued from Page 45)

on this. Bell moved fast when it introduced the Dimension PBX, and although ACS is more ambitious, Bell has significant in-house expertise.

Comparison With SNA

Many of the functions in IBM's Systems Network Architecture (SNA) are also part of ACS. While SNA puts network control at the user's location, ACS rests this control at the carrier's site, he explained.

The distributed intelligence capabilities of SNA will be included within ACS and IBM will have to make SNA more compatible to meet this challenge. One result will be increased X.25 compatibility for SNA users, he said.

For the next two years, private-line nets will still grow, but then. AT&T will work with users to transfer applications to ACS. Initially ACS will be priced a little below private-line services, but users will be charged extra for the value-added functions. Use of storage at ACS central offices and ACS "CPU cycles" will be extra cost features available to users of the phone company service, he predicted.

In effect, this will be part of a carrier pattern to force users off private-line, flat-rate facilities and onto intelligent public networks with timed pricing.

The private lines freed by users switching to ACS will be reassigned to switched dial-up facilities by the phone company, he said.

Although Bell has a master plan to integrate voice and data over its long-haul facilities, a voice version of ACS is not imminent. Such a capability, while technically feasible, does not seem to be in AT&T's plans, he said.

The ultimate service would include voice, data, electronic mail and video. But such a comprehensive offering would be too advanced for the telephone company to offer "in the near future," Martin said.

Additional details on the value-added services to be included as part of ACS are available in Martin's *A Special Report on Computer Networks and Distributed Processing*.

WU, Postal Service to Offer Two-Day Message Delivery

UPPER SADDLE RIVER, N.J. — Western Union Telegraph Co. and the U.S. Postal Service have signed an agreement that will provide high-volume mail users with two-day delivery of computerized messages via electronic transmission.

WU will provide the switching and transmission capability, with the Postal Service having responsibility for marketing and message delivery.

Electronic Computer-Originated Mail (Ecom) was designed for businesses and other organizations that send thousands of messages on a continuing basis and possess a computer or word-processing communications capability.

The Postal Service Board of Governors has authorized the Postal Service to propose Ecom to the independent Postal Rate Commission as a new subclass of first class mail.

One of the chief attractions of Ecom will be delivery of such items as bills and invoices. This could have a substantial impact on cash flow in a business organization, WU noted.

In addition, it would reportedly produce important savings for the customer through elimination of the costs associated with internal processing of mail and the purchase of supplies.

Mailgram Extension

Ecom is described as a logical extension of Mailgram service, which has been a joint offering of WU and the U.S. Postal Service since 1970. Both services combine the electronic message switching and transmission facilities of WU with the delivery capability of the U.S. Postal Service.

Ecom customers will be able to submit messages 23 hours a day, seven days a week, via Infomaster, WU's store-and-forward computerized message-switching centers, for routing to designated post offices.

Tapes or Disk

Messages can be originated by Ecom customers in the form of magnetic tapes or disks, or transmitted from intelligent terminals or word processing equipment to WU.

The messages will be processed by Infomaster and transmitted electronically to any of 25 designated serving post offices located throughout the country, WU said.

Once messages are received by the serving post offices, they will be processed and delivered within two days. Each serving post office will be equipped with high-speed printers, a minicomputer controller and direct high-speed telecommunications circuits, the company explained.

Ecom customers will be required to meet a minimum volume requirement of 5,000 message/mo. Rates are expected to range from 55 cents for a one-page message to as little as 30 cents for higher volumes.

The service is expected to be inaugurated by the end of this year. The agreement covers a 15-month preliminary phase and gives the Postal Service an option to continue for a subsequent three-year operation.

Selectric-Based Terminal Converted to Ascii Mode

ANN ARBOR, Mich. — A microcomputer has been added to the IBM TC-71 Selectric-based terminal by Newman Computer Exchange, Inc. (NCE).

NCE has Ascii-encoded the TC-71 by replacing its original electronics with a Motorola 6802-based microcomputer on a single board. This MPU performs the Ebcdic-to-Ascii code conversion, buffers data and still allows the terminal to be used in local mode for off-line typing, NCE said.

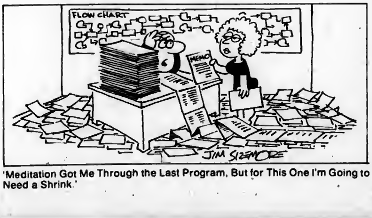
Serial operation is at 100 bit/sec or at 150 bit/sec with fill characters; 300-, 600- and 1,200 bit/sec rates are also available to operate with host machines supporting buffer handshake characters. Maximum printing speed is 15 char./sec, according to a spokesman.

For host machines which do not accept lower case characters, the enhanced TC-71 can be switched into a mode which transmits only upper case codes, he noted.

The normal unit uses PTTC-encoded typing elements; a $20 option allows the use of the more common Correspondence typing elements. Keyboard indicator lamps include power on, carrier detect and local/on-line mode.

The desk-mounted Selectric mechanism is refurbished before the MPU board is added. The unit is then tested as an Ascii RS-232 terminal, NCE said.

The price of the TC-71 is $864 with transportation charges COD. NCE can be reached at Box 8610, Ann Arbor, Mich. 48107.



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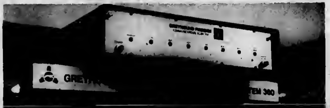

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Utah Location to Expand Univac Satellite Net

BLUE BELL, Pa. — Plans to add a third earth station in Salt Lake City to its Satellite Communications Network have been announced here by Univac. The station will allow more effective evaluation of network parameters, according to a spokesman.

Currently, two earth stations installed at development centers here in Blue Bell and in Roseville, Minn., are being used for two-way data communications via satellite. This satellite link is the first such installation commercially licensed using all digital two-way transmission in the C-band with antennas, five meters in diameter, the spokesman noted.

American Satellite Corp. (ASC), in compliance with Univac specifications, designed, installed and operates the Satellite Data Exchange (SDX) service using small earth stations that are connected to computer complexes at both sites. ASC will also install the earth station in Salt Lake City and provide the satellite communications service.

Projects in Blue Bell which use the intersite communications network are hardware design; development and maintenance of software and applications programs; and the manufacturing and financial information exchange. Salt Lake City applications will include the development of communications subsystems and terminals.

The Telcon networking system will be used for these communication activities.

A key objective in establishing the network was to allow optimization of data communications control procedures and formats for use over dedicated satellite links, the spokesman said.

In addition, the satellite system will provide the Telcon networking system with operation in mixed satellite and terrestrial communications networks.

Communications products designed in accordance with the Distributed Communications Architecture (DCA) will utilize the satellite network, the firm said.

The effect of propagation delays on data communications using satellites can be offset by developing digital control techniques that more efficiently use the link's wideband capacity, excellent reliability and low noise characteristics. Univac Universal Data Link Control (UDLC) procedures provide an efficient design for further satellite communication optimization, the spokesman said.

The cost of the satellite communications facility is comparable to that of high-quality terrestrial lines of equivalent bandwidth.

The satellite links will also be extensively used for technical conferences via freeze-frame television and for high-speed facsimile transmission. A supervisory voice channel is also available.

Seminars to Eye DP-Based Use Of Telephones

BROOKLINE, Mass. — Seminars addressed to computer-based telephone communications will be presented this fall by the Communications and Information Institute and Telephony Publishing Co.

Aimed at engineers and management personnel, the seminars will be held in Chicago, Oct. 23-26; Philadelphia, Nov. 28-Dec. 1; and San Francisco, Jan. 16-19.

Slated topics include:

- Digital Switching Trends I and II.
- Digital Microwave and Satellite Transmission in Telephone Networks.
- Fiber Optics and Broadband Communications.
- Marketing to the Bell System.
- Marketing Against Competition in Telecommunications.
- What to Look for in Future Telephone Equipment Registration.
- International Telecommunications.

Registration costs for the seminars are determined by their durations, which range from one to four days. One-day seminars, such as "Digital Switching Trends I," cost $195; two-day seminars, such as "What to Look for in Future Telephone Equipment Registration," cost $325; three-day events, such as "Marketing to the Bell System," cost $475; and four-day activities cost $585.

All meals and required materials and supplies are included.

Further information is available from Donna Ahrend, director, Communications and Information Institute, Suite 212, 167 Corey Road, Brookline, Mass. 02146.

Short-Haul Option Added to Micro800

CHATSWORTH, Calif. — The Micro800 data concentrator from Micom Systems, Inc. is now available with a high-speed composite asynchronous option designed to make the Micro800 more cost-effective in short-haul use.

The option allows Micro800s to be interconnected over limited distances using low-cost asynchronous line drivers or short-haul modems. It provides switch selectable asynchronous composite rates of 9,600-, 4,800- and 2,400 bit/sec.

The option is priced at $150. It is available on all models from two-channel to 16-channel. Prices start at $1,150 for a two-channel unit.

Micom is at 9551 Irondale Ave., Chatsworth, Calif. 91311.

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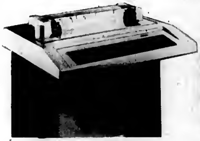

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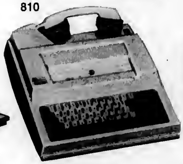

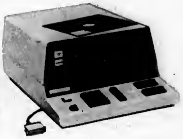

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MDS Extends DDP Options

Series 21 Gets 3270, Asynchronous Emulation

PARSIPPANY, N.J. — Mohawk Data Sciences Corp. (MDS) has added interactive communications capabilities to its Series 21 family of distributed data processing (DDP) systems.

The first of the added capabilities allows System 21/40 or System 21/50 users to emulate terminals in the IBM 3270 family, while the second permits asynchronous communications on all three Series 21 models, including the System 21/20.

According to MDS, the introduction of IBM 3270 and asynchronous communications allows the Series 21 user to choose between designing his DDP application for interactive inquiry into a remote host system, for batch transmission to the host or for a combination of local processing with interactive inquiry against local or remote files.

Interface Modules

The IBM 3270 network interface modules include:

- A 3270 CRT station emulator available for initial delivery in the first quarter of 1979, which supports data entry, inquiry into local or central data bases, and on-line transaction processing, according to a spokesman.
- An intelligent 3270 network interface, available in the third quarter of 1979, which supports on-line interaction between a remote Series 21 system executing user programs written in the Mohawk Business-Oriented Language (Mobol) and a host mainframe.
- A 3270 batch utilities package, also available in the third quarter of 1979, which enables Series 21 users to transmit data to a host via 3270 protocol with minimum operator intervention.

Asynchronous Emulator

The basic asynchronous emulator, which will be available for initial delivery in the first quarter of 1979, allows Series 21 operator stations to function as nonintelligent conversational terminals, transmitting data to or receiving data from a mainframe a character at a time or in batch mode via diskette or disk, MDS said.

An enhanced version of the asynchronous emulator, available in the third quarter of 1979, will add to those basic emulator capabilities such features as data formatting, operator prompting and a variety of display screen functions, all supported by Mobol routines, according to the spokesman.

Mobol programs can interact with host processor programs for direct data input and information retrieval, boosting the information-handling capabilities available at remote locations and providing organizational headquarters with real-time access to information anywhere within a DDP network, the spokesman said.

A 64K System 21/50 with two operator stations, one diskette drive, 10M-byte disk, a 45 char./sec printer and asynchronous or binary synchronous communications interface is priced at $656/mo on a three-year lease plus $176/mo maintenance. That system sells for $30,821.

MDS is at 1599 Littleton Road, Parsippany, N.J. 07054.

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DXS increases the efficiency of your network by eliminating peak loading problems. You can access data from both the DXS and the host in one transaction. And because DXS reduces host dependency, your remote users are assured access even when your host computer is unavailable.

DXS is powerful and versatile. In a specialized configuration, the DXS is used by the banking industry in automated funds transfer system (AFTS) applications.

DXS expands easily and inexpensively. For instance, to add terminals at a remote site, DXS requires only a simple controller unit costing less than $1000.** And the terminals can be located up to 10,000 feet away from either a DXS or remote controller unit — connected with low-cost standard twisted-pair wire.

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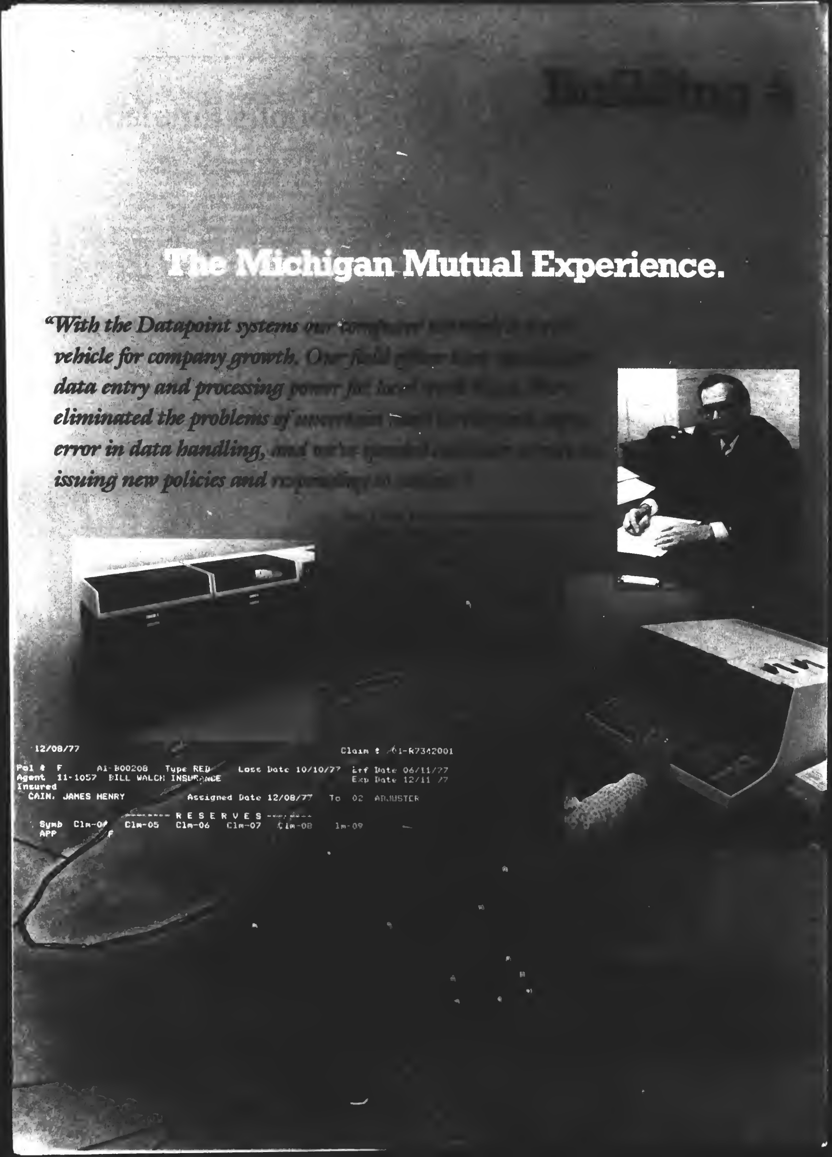

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Paradyne Adds Converter

LARGO, Fla. — A converter that allows minicomputers, CRT terminals, plotters and other asynchronous devices to transmit data through synchronous modems at speeds of up to 19.2k bit/sec has been introduced by Paradyne Corp.

The asynchronous-to-synchronous interface, Model ASI-192, is designed for use with modems in polled or switched networks or in dedicated line environments. The device supports modems operating at 2,400 bit/sec on unconditioned 3002-type communications lines, 4,800- and 9,600 bit/sec modems and SRM-192 short-range modems operating at 19.2k bit/sec. By contrast, telecommunications between asynchronous devices through asynchronous modems is typically limited to 1,200 bit/sec.

The Paradyne asynchronous-to-synchronous converter costs $350 and is available in 30 days from Paradyne Corp., 8550 Ulmerton Road, Largo, Fla. 33541.

Wiltek, Globcom Linked

NEW YORK — The international telecommunications services of RCA Global Communications, Inc. will soon be available to users of about 3,000 data terminals installed in the U.S. by Wiltek, Inc.

The companies have signed an agreement to interconnect the RCA Globcom Kingsbridge Communications Center in Piscataway, N.J., to the Wiltek domestic computer center in Norwalk, Conn. This will allow Wiltek terminal customers to use RCA Globcom's overseas Telex, telegram, leased channel and marine services without acquiring any additional equipment, according to RCA.

By using a terminal to access RCA Globcom, the Wiltek customer gains a number of RCA benefits including message batching, abbreviated dialing, message retrieval, conversion of Telex messages to telegrams after a specified time and automatic retry of Telex calls.

Service is due to start before the end of the year.

Details of the service are available from Wiltek in Norwalk, Conn. or RCA Global Communications at 60 Broad Street, New York, N.Y. 10004.

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- Data Base Design and Administration (2 days)
- Application Analysis Methods (2½ days)
- Report Writer Fundamentals (2 days)

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Denver San Francisco
Los Angeles

By special arrangement, MRI will also conduct classes at customer sites or in other cities. In the customer site classes, the instructor tailors the standard courses to deal exclusively with the student's own hardware configuration, operating system, and data management facilities.

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In-House Design Saves Money

Micro-Based CRT Net Helps Monitor Power

By Ann Dooley
CW Staff

ATLANTA — The Georgia Power Co. here designed its own microprocessor-based color CRT system to save money in its complex work of monitoring power line usage.

Georgia Power is part of a larger utility network composed of several Southern utility companies. The network has substations that communicate with an IBM 370/165 in Birmingham, Ala., the system's headquarters.

The substations are where the area power lines come in and where the power is switched and distributed to customers, James Neel, senior communications engineer, explained.

In this kind of work, it is essential to continually know the amount of voltage and the current that is flowing through the power lines, Neel observed. That information is collected by data circuits that run from Birmingham to each substation and gather all the data.

Until recently, the whole utility system used a hardware system with color CRTs that was efficient but expensive. So, as senior engineer, Neel experimented with 8080-based Intercolor Corp. CRT terminals to simulate the system Georgia Power had been using.

Cost savings were enormous, he said; the previous CRTs cost $25,000 each while the Intecolor CRTs cost about $4,000 each. Of the 80 or 90 CRTs used throughout the system, only five Intecolor models are currently in service, but more will be added as the old ones are replaced, he said.

In simulating the old system, "I wrote machine langauge, programmed it on an 8080, used an Imsai computer which I plugged into the program and it was ready," Neel recalled. "The system uses 4,800 disk/sec and I had to build a hardware interface, also.

"The whole thing took a few months to do, but it's really very simple as long as you know what you're doing," he added.

"It's been a year since the Intecolors were put into operation and they've worked out fine, according to Neel. All in all, "we're very happy with the new system," he said.

The CRTs were somewhat prone to problems when they first arrived, but after that they worked well, he noted.

In addition, Intecolor provided fast delivery and excellent maintenance, he said.

Two Advantages

The obvious advantage of using the simulated system is the cost savings on each machine, Neel observed. Another advantage, however, is the flexibility gained by using a micro-based system instead of hard-wired logic, he said.

Monitoring the power system is complex and fast-moving work and color CRTs are of great help, Neel said. The color can show the different voltage amounts in varying colors for better clarity.

In this way, attention can be called to one specific feature in the whole sytem, such as the alarm system being displayed in a different color or in a blinking pattern.

The system has been set up so different colors show different systems and are immediately recognizable by the operators. The color CRTs also cause less eye strain, many of the operators have observed, Neel said.

Intecolor CRTs were chosen for the simulation because the power system requires 48-line display with high resolution graphics and Intecolor was the only vendor that could provide that capability when the changeover took place, according to Neel. The computer-based system was also important so the system could be changed to do the applications specifically required by the utility network.

Monitoring Work

A substation's job is to inform power company headquarters about what is continually occurring in the system, Neel said. Data on the voltage, the current and which switches are open and closed must be instantly available at any moment.

All of the information must be able to be displayed instantly to the person making decisions about whether to close or open power lines, Neel pointed out.

Two IBM 370/165s — one a backup system — collect all the information monitored in each substation by microwave circuits. The microwave circuits go out to eight control centers in Georgia and other centers within the entire utility system.

Once the information is collected from the substations by the IBM 370/165, it is sent to the control centers. There, information is displayed in menu style and operators can select the display they want.

Using a light pen on a CRT, an operator can send a signal to the 370/165 to open or close a switch; the 370 then sends a signal to the substation telling it what action to take.

The IBM 370 constantly polls the control center CRTs to ask if anything should be done and the CRTs respond affirmatively or negatively, depending on what kind of data they have.

The supervisory control system at the substations is responsible for taking care of the control circuits and monitoring to make sure everything is running properly.

Each substation controls only a selected area of the state; the system in Birmingham knows which should be doing what so one substation never interferes with the work of another.

In addition to control and monitoring, the system performs data logging for historical records and analysis. The Intecolor CRTs are also used for certain engineering programs.

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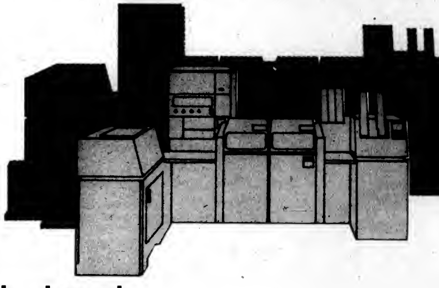

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Air Freight Firm's Private Net Serves 22 Sites

LOS ANGELES — Flying Tiger Lines considers itself a pioneer among air freight companies in the field of data communications.

In 1973-74, Tigers was among the first companies in the air freight business to develop and implement a comprehensive on-line system for automating operational aspects of the business. This covers a variety of functions involving the movement and tracking of air cargo. The company's on-line system has increased efficiency and improved customer service according to R.V. "Dick" Reynolds director of computer services and communications.

"Flying Tigers was also among the first companies to use an in-house central network control center to implement remote site diagnostics in the multidrop system."

The present private-line network services 22 locations in the U.S. and 10 in the Far East. Terminals include Incoterm Corp. CRTs and Printronix, Inc. receive-only printers. Modems are provided by Racal Milgo, as is the System 180 central site diagnostic controller. The 24 LSI modems operate at 2,400 bit/sec.

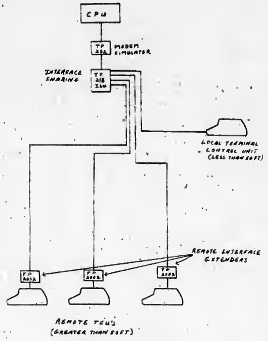
Flying Tiger Lines has an application consisting of an in-house circuit servicing terminals and terminal control units at distances up to 600 feet from the CPU at the DP centers in L.A. It uses the same multidrop protocol as the external network. To eliminate the expense of phone lines and modems the firm chose to use a combination of local data distribution equipment furnished by Teleprocessing Products of Los Angeles. This equipment consists of modem simulators interface sharing units and remote interface extenders.

Both internal and external inquiries are transparent to the dual IBM 360/65s, which operate with dual 3705 front ends. Software for the system is an adaptation of the IBM Pars airline system.

The accompanying diagram represents the configuration of this in-house system.

Use of the Teleprocessing Products equipment provided Tigers with some unique advantages. For instance, although the external network is operated at 2,400 bit/sec for reasons of economy and reliability, the in-house circuit can be operated at virtually any synchronous data rate by changing option jumpers in the modem simulator. Although the circuit was installed at 2,400 bit/sec, it has been successfully tested to 9,600 bit/sec and is currently being operated at 7,200 bit/sec.

The use of the Teleprocessing Products interface sharing unit (ISU) allows the use of these higher data rates without imposing the throughput penalty normally associated with high-speed multidrop lines. With the ISU, line turnaround delays are eliminated. The remote interface extender allows the extension of the EIA interface beyond the nominal 50-ft limit throughout the system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Flying Tiger On-Line System

Tymnet II Public Net Facilities To Boost Data Handling Capacity

CUPERTINO Calif. — The data handling capacity of the Tymnet communications network will reportedly be boosted "up to tenfold" this fall in a version called Tymnet II.

Tymnet, Inc.'s Advanced Communications Technology (ACT) has yielded a "network of unprecedented size and capability for public use, with a transmission volume capacity sufficient to assure economic [and] . . . sophisticated intelligent communications virtually anywhere," according to a spokesman for Tymshare, Inc., of which Tymnet is a subsidiary.

ACT incorporates multiprogramming and memory protection techniques in two proprietary communications tools developed over the past 18 months by Tymshare's Data Networks division: the "Tymnet Engine" — a minicomputer to "drive the enhanced network's supernodes — and a software operating system called the Internally Switched Interface System (Isis).

Microprocessors in the 32-bit Engine can reportedly accommodate any Tymnet II transmission speed and capacity enhancements that growing demand may invite over the next several years.

The Engine features 1M byte of main memory, a capacity for up to 300M bytes of disk storage, direct memory access, six interrupt levels, 16 sets of 16 registers each, three levels of privileged instructions, microcode and hardware diagnostics and a "user-engineered" console.

The Engine is said to offer a 750-nsec memory cycle time, as many as 32 high-speed synchronous I/O channels and up to 256 medium-speed asynchronous, "fully monitored" channels.

"Isis enables us to interconnect previously incompatible and dissimilar devices such as a simple asynchronous terminal or asynchronous host interface and to handle a gateway process connecting different network technologies," another spokesman said, adding that Isis can support up to 64 separate partitions in one node.

The Tymnet II environment will reportedly accommodate X.25, X.75, X.28, High-Level Data Link Control, Synchronous Data Link Control and Advanced Data communications Control Procedure protocols.

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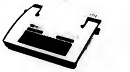
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Show's Speakers Report

New Options Facing Systems Designers

Special to CW

LOS ANGELES — Systems designers are finding a whole new range of options open to them, thanks to the emergence from the laboratory of bubble and charge-coupled devices (CCD), the trend toward hybrid memories and hierarchical storage and the increased distribution of intelligence in various portions of a system.

Distributed processing appears to be a logical beneficiary.

To be sure, there are more goodies coming from the lab, such as electron beam access memory and increasing miniaturization of the CPU portion of a chip.

But the message contained in the speeches at the Western Electronic Show and Conventin (Wescon) here recently appeared to be that the ball is in the system designer's court.

CW At Wescon

Casting somewhat of a shadow over the rosy glow of possibilities is the perennial consideration of whether it is economically feasible to alter the operating system to fully utilize the potential of the new technological goodies. That question remains unanswered.

Here's a brief overview of some important considerations explored at Wescon and discussed in the accompanying stories.

First, at what point does a microprocessor with lots of on-chip memory become an actual intelligent memory? Such a device lends itself to distributed processing and multiprocessing systems.

The distribution of intelligent controllers to all areas of the system could greatly relieve the workload of the CPU — be it a micro or a larger unit.

Hierarchies Are 'In'

A hierarchy of memory is nothing new; most systems have at least a couple of types such as disk and main memory. Not only will there be more levels in the hierarchy, there could even be hierarchical systems comprised solely of different kinds of bubble memories. If nothing else, that would be a great physical space saver. More and more emphasis is being placed on matching the memory speed to the CPU.

While micros and memories are busy combining on chips, look also for combinations of different types of memory on a chip. How about a CCD/RAM or, off a chip, the use of bubble memory in a floppy disk drive?

Market Elasticity

The advent of more compact, faster memories will only prove how very elastic the memory market is.

For instance, distributed processing and its increased use of standard interfaces among components creates a need for RAMs to buffer the data rates to accommodate the standard interfaces.

The net effect of the bounty of memory and intelligence that undoubtedly will be sprinkled liberally throughout a system's various functional components will be fun and challenging to the designer, but ultimately systems will be more responsive, more capable and easier to use.

Price/Performance Goals, DP Pushing Variety of RAM Uses

Special to CW

LOS ANGELES — With all the talk about various emerging and future memory technologies, one might think the tried and true random-access memory (RAM) would fade into the sunset. Far from it.

A trio of speakers from Signetics Corp. told a Western Electronic Show and Convention (Wescon) session here recently that several factors are encouraging the use of RAM in areas previously served by other types of memories.

The influencing factors include price/-performance goals and the spread of distributed DP and plug-compatible mainframes.

"These market [influences], through their impact on system specs, architecture and performance goals, will [affect] the selection of high-speed static RAM to perform a number of system functions," according to a paper by Michael Shields, Stephen Jasper and John Campbell of Signetics Corp.

RAMs are being used increasingly as control storage because they facilitate the field upgrade of new features and thus help guard an equipment base against being obsoleted by competitors' new features, they said.

In addition, RAM control store will be a key element in providing the ability to execute multiple instruction sets, thus allowing the design of a machine that offers plug compatibility with more than one computer, they observed.

Add-on memory is another area long dominated by dynamic RAM that is opening up to static RAM. The 3033 memory is an example.

The growth of distributed processing and its accompanying use of standard interfaces is creating a need for more memory to buffer machine data rates to the standard interface, they observed.

Previously the interfaces between CPU, channel, control unit and device were defined by the manufacturer, but now designs are using high-speed buffers to accommodate standard interfaces, they explained.

The use of cache memory is increasing. With larger size, efficiency can be improved by expanding to multiple pages "so that instructions surrounding several recently ex-

(Continued on Page 59)

Micro's Sophistication Seen Leading to Smart Controllers

Special to CW

LOS ANGELES — Controllers of tomorrow will be as intelligent as the CPUs of today and will acquire more features, including programmability, intelligence and local memory, Michael Smolin of National Semiconductor Corp. told a Western Electronic Show and Convention (Wescon) session on 16-bit microprocessors here recently.

Just as the density of semiconductor memory is doubling about every two years, the growth in complexity of microprocessors — number of gates — is growing at the same rate, he stated.

Attention has been focused on the use of micros as CPUs, but shipments of microprocessors as controllers are far more numerous, he indicated.

These intelligent controllers are acquiring more and more features specific to their applications. Eventually there will be sophisticated micro CPUs surrounded by highly intelligent microprocessor controllers, he said.

The future will see greater and greater collaboration of memory and micros. Indeed, some observers are predicting that micros and memory will soon be combined on the same chip.

This distributed intelligence in memory has interesting applications in multiprocessing, he continued.

(Continued on Page 60)

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Keypunch Replacements Increase Output 30%

NEW HYDE PARK, N.Y. — A distributor of movie films and video cassettes has found that replacing a keypunch operation with a data entry system means an increased production rate of at least 30% and a savings of approximately $30/mo is possible.

Modern Talking Picture Service is one of the largest distributors of these films. Each year, it receives bookings for 1.5 million films and video cassettes from school and community groups.

At present, the company books 700 to 800 films weekly, reaching an estimated audience of 125 million people annually. Most films distributed by the company are sponsored by commercial companies to promote a product or a service.

Using a Univac Computer-Assisted Data Entry (Cade) system, operators key in film number, booking number, date, address and so on. Almost all the information entered in this way is original — not pulled from the system's memory — except when more than one film has been entered; in those cases, the name and address are automatically repeated in subsequent documents.

The company uses extensively the table lookup capacities of the system. For example, codes for the 50 states are stored in the system. If an operator enters an invalid state code, the system notifies the operator.

Audience Analysis

Computer analysis of audience reactions to the films is critical to the company's business. To do this, data from formal show reports, certifications, periodic summaries and audience profiles is entered into the system for transmittal to the computer. Computerized statistics on successful films provide specific guidelines for creative effort.

Both the mainframe and the Cade system play an important role in the sponsor satisfaction phase of the company's reports. These reports outline the exposure and impact of the sponsor's film according to three different measurements: the number and types of groups seeing the film, the total number of viewers and the viewer reaction.

The information for this phase is obtained from show reports that represent an almost 100% return from exhibitors. The data for these reports originates in cards filled out by the person showing the movie and, in turn, are the basis for monthly performance analyses.

The input for these reports is automatically checked for content as it is entered. If the wrong film number or other incorrect data is entered, it is flagged for correction by the operator.

Data Entry Dimensions

The resulting volume of computer input from this and other applications is large and varied. Wide audiences can be reached at a cost which compares quite favorably to that of other mass media.

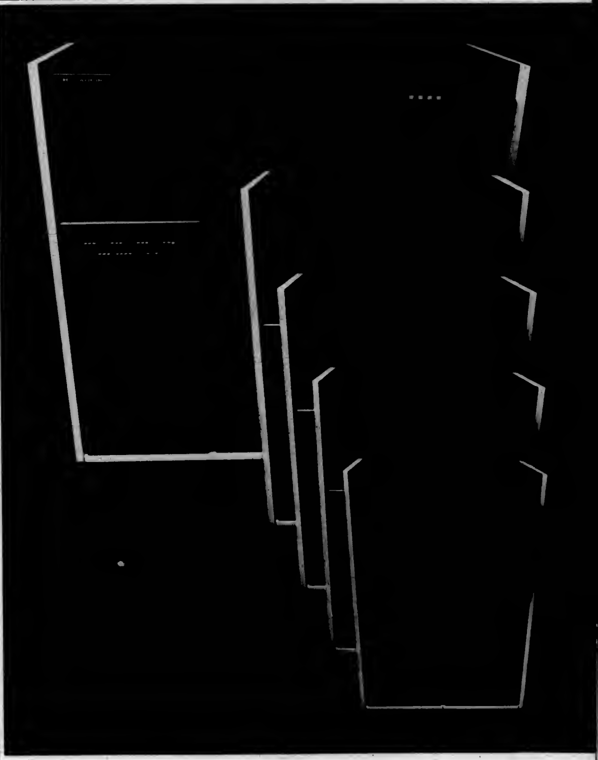
The DP work involved in handling bookings, associated documents and feedback reports is obviously heavy, since the average TV station uses more than three hours of film each week and the company services more than 90% of the TV stations in North America.

To prepare data prior to the system's introduction, 14 IBM keypunches were used full-time along with three key-to-tape units. Although the company felt the devices were effective, the constant operation produced a noticeable noise level.

Although the cards were verified, a certain percentage of errors still slipped through and placed the burden of error detection, in the edit programs, on the mainframe.

Accumulation of punch cards was another drawback to this system. In addition, they had to be hand carried, then sorted and converted to magnetic tape for computer input. These problems were magnified by the company's growth.

The company's Cade system consists of a minicomputer with 13 keystations that provide direct tape input to the mainframe. Each station has a keyboard and a screen which allow the operator to verify all entries and permit the rollback of previous data.



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Third Parties Seen Good Way to Fight Inflation

By Edward Cherney
Special to CW

TROY, Mich. — Inflation is currently running in excess of 10% per year, hampering productivity improvement programs throughout industry. DP operations have been hit particularly hard; a combination of factors has seen DP operating and equipment costs march side by side up Inflation Hill.

The third-party marketplace of the computer industry is particularly sensitive to the strong upward swing of inflation. However, this market has proven the benefits of free market competition in the face of runaway inflation.

Particularly sensitive to prices, equipment, lease terms, customer demands and requirements, third-party firms are being called into more and more corporate offices to discuss buying, selling, trading or leasing computer equipment. And third-party market firms have to be in the position of providing answers — and equipment — to these firms in an extremely short period of time, at competitive prices.

The third-party marketplace is an alternative to buying or leasing directly from the manufacturer. This alternative also permits the DP vice-president or manager to tailor his system requirements to marketplace conditions.

A primary function of the third-party marketplace company is to maintain an equipment inventory or to be totally aware of equipment availability. This combination of inventory and availability lists also keeps a daily finger on the price pulse of the marketplace. And price is the ultimate arbitrator of most DP transactions.

One Constant

The third-party marketplace is a growing, explosive ever-changing place. Moves such as the 20% price decrease on the IBM 370/138 and 148 earlier this year assures the DP user that third-party companies must remain constantly alert to potential price changes and changing market conditions.

The purchase of DP equipment has long since passed the "gee whiz" stage as DP professionals and corporate financial executives make decisions jointly. The decision is usually based on how to get the most computer performance for the dollar expended, which is the main reason that the third-party market has grown to be an annual $2.6 billion industry.

The emergence of the third-party marketplace has permitted users to wage a two-pronged fight against DP equipment cost increases and price spirals.

First, it has given industry and commerce an alternative to buying or leasing from the manufacturers; this allows many users to reduce their DP equipment budget.

Secondly, it allows the firms to get more equipment (or increased capacity) for the same budgeted figure.

Corporate executives can now shop for the best price/performance package. An example is the company that is looking at an IBM 360/148 which has a manufacturer list price of approximately $650,000. While the company would like to purchase more capacity and capability in the form of a 370/155, the OEM list price on the 148 is all the company can afford to invest.

By shopping the third-party marketplace, user would find the price of a 370/155 to be approximately $425,000. The result: more capacity at less price.

Yet another example would be the user which needs to make a major leap in computer capacity, like going from a 370/138 to a 370/155. This kind of quantum leap forward would be out of reach of many small to medium-size companies if it were not for the third-party marketplace.

The manufacturer's list price of the 370/138 is approximately $350,000. If current third-party market prices of $425,000 for a 370/155 hold up, a company could take that giant step forward in DP equipment capacity for an additional $75,000 — which, when amortized over the life of the contract, is within reach of most firms.

Finally, the third-party marketplace allows companies which own computers to get fair market price for their present equipment. For years, the question of how a fair market price could be established for a particular system was raised. That question was answered with the emergence of the third-party marketplace some 11 or 12 years ago.

Instead of one company setting the price, there are now dozens of competitive firms buying, selling, leasing and trading equipment. This assures the owners (or leasees) of obtaining full credit and value for their systems on the open marketplace.

Cherney is president and chief executive officer of CMI Corp., which is engaged in buying, selling and leasing IBM equipment.

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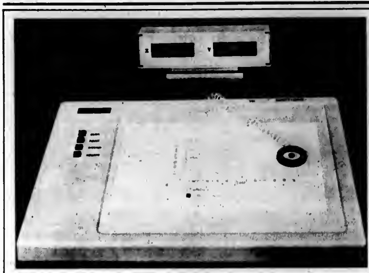

HI Pad

Smart Digitizer Offered by HI

AUSTIN, Texas — Houston Instrument, Inc. has introduced an intelligent 11- by 11-in. active digitizer that features metric and inch capability, binary and BCD outputs and two user-selectable interfaces.

The HI Pad is said to be accurate to ±.015 in., with a resolution of .005 in.

Four buttons on the edge of the tablet allow the user to relocate the origin and select either point or stream modes of operation. The unit comes with RS-232C and 8-bit parallel interfaces.

The unit is available for $795 from the company at One Houston Sq., Austin, Texas 78753.

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Good news and bad news for 370 and 303X users.

First the bad news. You can't run your faithful 1400 series programs because IBM has eliminated the emulator.

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User Increases DP Budget 10%, Triples Speed

SOUTH BEND, Ind. — The University of Notre Dame is replacing its present mainframe with a larger machine that has about three times the processing speed and twice the memory capacity of its present system, according to Brian R. Walsh, computing center director.

The replacement is an 8M-byte IBM 370/168; the old machine is a 4M-byte IBM 370/158 the university acquired in 1974. It will increase the center's annual budget of $1.6 million by about $120,000 under a leasing arrangement with lessor Itel Corp.

"We are getting at least a 300% increase in performance and processing speed for less than a 10% increase in cost," Walsh said.

Itel began installing the 8M-byte CPU and memory in August, and the two machines are expected to run simultaneously until the changeover is completed. Very little lost time to users is expected.

Greatest Benefits

The greatest benefit of increased computing capabilities will be in two areas — scientific research, which accounts for about 60% of computer use, and instructional use of the computer.

The most significant effect of the change, Walsh explained, will be more effective and better quality research with the same amount of time invested. Physicists, chemists and aerospace researchers, for example, can now simulate an event in 10 hours instead of 30, which means they can look at more complex models within the same 30-hour time frame they had available to them.

About 3,300 students a semester take courses that require using computer terminals. Enrollment has been limited by the number of terminals which can be used concurrently and their response time. Now, instructional use of the computer can be more effective, Walsh said.

This is the fifth time the central computer has been upgraded since the computing center was dedicated in May 1963. Walsh said there will be no changes in operating systems, staff or software packages.

Honeywell Users Get Tape Drive

PHOENIX — The U.S. Information Systems Group of Honeywell, Inc. has added another 9-track magnetic tape unit for its large-scale systems.

The MTU0610 dual-density tape unit, operating at 800- or 1,600 bit/in. and 200 in./sec, supports the company's Series 60 Level 66, 66/DPS, 68 and 68/DPS large-scale, general-purpose mainframes.

Standard features include automatic tape and head cleaners, an automatic power window, automatic cartridge load and automatic threading.

The unit costs $25,800, with a monthly maintenance fee of $136. Typical lease prices range from $658/mo on a five-year plan to $764/mo on a one-year lease, the company said from P.O. Box 6000, Mail Station T60, Phoenix, Ariz. 85005.

Throughput Increase Foreseen

'Flubble': Possible Hybrid Memory of Future

Special to CW

LOS ANGELES — "Flubble" was one of the terms that emerged from a session on the impact of new memory technologies on computer design at the Western Electronic Show and Convention (Wescon) here recently.

Representing the trend toward hybrid memory devices, a flubble would consist of a buffered floppy disk drive in which an entire track (or more than one track) is stored in bubble memory contained in the disk drive, according to George Sollman of Shugart Associates.

Such a combination of disk and bubble could increase system throughput because of the high probability that the CPU would require a record stored in the bubble buffer for its next operation.

Looking at the marketplace for floppies and other small disks, Sollman said the trend in both the word processing and small business systems areas is toward downward growth, or the development of low-cost, high-volume systems. At the same time, the low-end systems are adding capabilities.

Other future developments could include the use of bubbles and charge-coupled devices (CCD) as substitutes for fixed disks in systems, he said.

These will not compete with floppies for I/O applications because floppies have a price advantage, he continued.

The cost per bit of bubbles in 1985 is projected to be about 20 millicent/bit compared with a floppy cost of less than .1 millicent/bit, he said.

Bubbles are more likely than CCDs to emerge in this application because CCDs are volatile, he added.

Sollman sees good growth opportunities for both floppies and fixed disks.

Floppies could increase in capacity to 5M- to 10M bytes per diskette by the end of this decade if the diskette itself can supply track position information, he said.

Advances in media are needed to provide high yields in spite of substantially narrower tracks, he said.

Sollman expects more small business systems makers to use floppy and fixed disks, just as IBM has in several of its systems.

CW At Wescon

"The cost benefits are substantial, for it should be possible to provide a 15M-byte fixed disk for less than $1,500 and a 30M-byte fixed disk for less than $2,000 in OEM volumes," if Winchester technology is used for the hard disk, he said.

Sollman hinted at the advent of a hard, small disk that could contain 5M- to 10M bytes. "This device would provide for some very interesting high-performance systems in a very compact size. In fact, existing floppy disk systems would be subject to substantial performance upgrade, by the addition of such a compact fixed disk," he remarked.

"The cost could also be attractive with OEM price estimates of substantially less than that of the 15M-byte fixed disk appearing feasible," Sollman said.

RAM Domain Seen Expanding

(Continued from Page 55)

ercised branch instructions can be stored. Improved cost/bit of high-speed memory is making this approach to performance enhancement attractive," they observed.

As equipment becomes more complex, there is a need for large control store size. For instance, "word depth of minicomputer control stores has doubled since 1977 and will probably quadruple by 1981 as mini makers attempt to build in" 370 series capability, they commented.

Photomatrix Unveils Diazo Fiche Processor

SANTA MONICA, Calif. — Photomatrix Corp. has introduced a processor capable of processing 105mm diazo film at speeds of more than 1,000 microfiche/hour, according to the company.

The Model 860 processor uses aqueous ammonia to process the film without the need for any special venting, the company said. It sells for $3,300 from the company at 2225 Colorado Ave., Santa Monica, Calif. 90404.

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Honeywell Users Plan Confab

SAN FRANCISCO — The sixth national meeting of In House, Inc. (IHI), an independent group of Honeywell, Inc. computer owners and users, will be held at the Golden Gateway Holiday Inn here Oct. 1-3.

IHI was organized in 1977 to attempt to meet the challenge of increasing costs and declining service in maintenance of the Honeywell 200/2000 and other third-generation systems, a spokesman for the group said, adding that the organization would be of interest to any owner/user of that equipment.

Additional information about the IHI meeting is available from IHI at Box 726, Falls Church, Va. 22046.

Univac Group Set for Atlanta

ATLANTA — The Americas Univac Users Association (AUUA) has announced that its Fall Conference, focusing on the theme "The Future — Innovations and Expectations," will be held at the Hyatt Regency Hotel here Oct. 23-27.

The meeting, to feature Charles Lecht as keynote speaker, will include sessions on "peopleware," as well as hardware and software. In addition to the technical sessions, conference sessions are planned.

Further information on the meeting is available from Barbara Gattus of Diamond Shamrock Corp., Foods Division, 2101 Ralls Ave., Baltimore, Md. 21222.

Todd Unwraps Power Switcher

FARMINGDALE, N.Y. — A 100W power switcher recently introduced by Todd Products Corp. features output ranging from 20A at 5 V through 2.5 A at 48V.

The switcher is said to offer line and load regulation of .1% with ripple of less than 50mV (peak-peak) and transient response under 500 microsec. Input to the unit can be 115- or 230 Vac (strappable), with brown-out protection to 85 Vac, according to a spokesman.

Efficiencies of the unit range up to 87% depending upon output voltage, a spokesman said.

The unit sells for $225 from the firm at 123 Milbar Blvd., Farmingdale, N.Y. 11735.

Tape Care Set as Topic

REDWOOD CITY, Calif. — Ampex Corp. will hold a series of special seminars detailing critical aspects of magnetic tape manufacture, care and handling at various locations throughout the country. The sessions will include lectures and visual presentations, as well as question-and-answer periods, a spokesman said.

Among the topics to be discussed will be tape construction, mixing, coating techniques, surface processing, slitting, identification of defects and product certification, Ampex said. Also to be discussed will be special problems encountered in the tape manufacturing process, as well as tape specifications, government specifications and new-generation tapes.

The first seminars are scheduled for Oct. 9-13 in the Chicago and Detroit areas. Additional locations include Dallas/San Antonio (Oct. 23-27); Long Island, N.Y., and Boston (Nov. 6-10); and Washington, D.C. (Nov. 29-31). Los Angles, San Francisco and the Kennedy Space Flight Center will also be covered at later dates.

Additional information is available from W.D. Schaffer at Ampex headquarters here.

Controllers Seen Getting Smarter

(Continued from Page 55)

For instance, intelligent read-only memory is suitable for intelligent I/O processors, number crunchers and processor controllers.

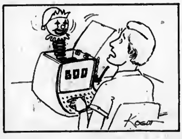
And intelligent RAM could be ideal for a multiprocessing scheme in which "each processor working on a problem would download into its local memory from main memory a part of the problem on which it is to work and then would free the bus most of the time while working from its own local memory," he explained.

While it is possible to interconnect almost limitless numbers of CPUs in hardware, the "next major bundle in the industry will be to develop appropriate software techniques for transparently parsing the software problem," he said.

"The function of this parsing would be to efficiently utilize all the CPUs in a system." Because of their low cost, additional CPUs in the form of intelligent ROM can be used.

In the future, E-beam technology should shrink the CPU part of a chip to about 10% of its present area, leaving 90% available for new functions, he stated.

To accommodate some of these new functions, many of which will be application-driven, the chip may need other features such as operating systems in firmware, memory protection and more addressing modes, he said.



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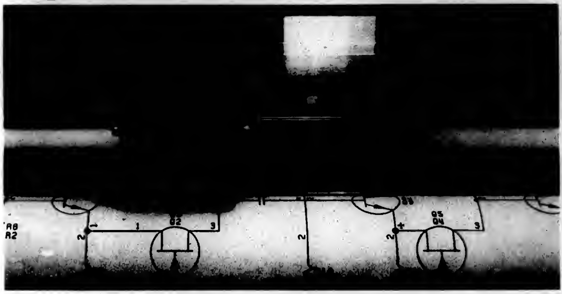

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Of course, you may not need the sophistication of a 1055 right now. In that case, our new 1051 is the answer. You get 10-ips performance today, and the ability to field upgrade to a 1055 tomorrow — when your needs have expanded.

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To arrange a special preview demonstration of the new 1055, please call your local CalComp sales representative in the following areas:

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See the 1680 COM and 1012 Desk top plotter at Info '78, Booth 199

Documation Planning Centralized Upkeep

By a CW Staff Writer

MELBOURNE, Fla. — Documation, Inc. has taken the first steps to establish a centralized maintenance control center for users of its card and printer equipment. The move runs against the direction often taken in such operations, in which control and communications are under local control.

The company has already established a manual center at its headquarters here for use in the customer maintenance operation. In that operation, customers call a toll-free Wats number and describe their problems to Documation personnel, who then relay the information to the appropriate field engineer.

This relaying is now done by dialing a telephone number in the appropriate city which automatically "beeps" the engineer, who wears a paging device.

Plans call for installation of an on-line system to store customer data as well as track trends in malfunctioning equipment.

In addition, a spokesman said, a direct radio link is planned in which personnel working at the maintenance center will be able to communicate directly with the personnel responsible for repairs.

Schedule of Service

To accomplish this, Documation plans to install a number of transmitters in several locations around the country. However, on-line diagnosis of malfunctioning equipment will not be a feature of the system, the spokesman added. Full automation of the system is planned for the first quarter of next year.

At present, seven cities — Dallas, Denver, Detroit, Atlanta, Philadelphia, Cleveland and St. Louis — are on the manual system. Twenty-three cities will be included by November, with nationwide service expected by next year, the spokesman explained.

"The data base will be extremely beneficial to us," according to John Barthelmy, a spokesman for the company. "We will record the amount of time required, as well as the nature of the failures, preventive maintenance done on the equipment and so on."

"We want to handle trouble calls as consistently as possible and eliminate the middle man — for instance, answering services — so that every time a customer calls in, he will get someone who can give him the service we want to give him every time he calls in," Liz Ludwig, manager of the center added. "At present, we have nearly immediate response to the customer by phone by the field engineer, and the field engineer is supposed to arrive at the site within two hours of the call," she said.

The idea for the center originated a year ago, according to Ludwig. "The center we have now is completely manual for two reasons: We wanted to be able to work out any bugs, since this is a new idea and we wanted to make sure we had the procedures down right; and we wanted to establish a firm backup in case something happened to our electronic system," she noted.

"With the center, we will be able to get the service to the customer as quickly as possible and to establish a data base so we can head off trouble spots before they become serious problems and spot trends in equipment failure," Ludwig concluded.

Storage Material Cuts Laser Power

PALO ALTO, Calif. — Drexler Technology Corp. has unveiled a reflective, direct-read-after-write (Draw) laser material said to require less than half the laser power for recording of any Draw material yet introduced.

Dubbed Drexon, the material is now being produced on glass substrate in prototype quantities. A patent for the material is currently pending, according to Jerome Drexler, president of the company.

The reflective plastic/metallic coating is capable of storing up to 2M by 108M bit/sq in., Drexler said. At that density, a plate with a 6 in. diameter could store over 700 M bytes — or as much as seven IBM 3333-type disks.

Approximately 30 companies worldwide are working on optical storage of data, Drexler noted. Most of these have been recording digital and optical data on thin metal films which are coated on rotating disks or on nonrotating plates.

These materials require relatively high laser power, Drexler stated, adding that they are also expensive to manufacture and prone to substrate defects that cause data errors.

By contrast, Drexler noted that Drexon — which he estimated would cost approximately 10 cents per megabyte compared with $3 per megabyte for disk storage — ensures lower data error rates, as well as lower power lasers.

Samples of the material have been subject to extensive testing a Drexler spokesman said. One series of tests demonstrated recording could be accomplished with a 5 mW pulse lasting only 100 nsec, he noted.

The significance of Drexon is that for the first time, a reflective, laser-recording material with Draw capability is available for commercial semiconductor lasers, the psokesman said.

Further information on the product is available from Drexler at 3960 Fabian Way, Palo Alto, Calif. 94303.

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- Top and bottom form margins
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- Self-test mode

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On-Line System Speeds Access to Patient Data

By Larry Blevins
Special to CW

FORT SMITH, Ark. — Patients who return to Sparks Regional Medical Center for additional treatment no longer have to supply the same personal information they gave on their first admission. Nor do they have to wait while a clerk searches for the date of their last X ray or other data.

Since May 1975, this information has been collected and stored in the medical center's patient history system. Although only minimal clinical data is stored in this system, it does provide data on the hospital services previously used by the patient.

Before the system was implemented, a patient could have been identified under as many as 17 different identification numbers. Under the latest system, these are consolidated into one patient number.

The on-line system, running on our IBM 370/135 mainframe, provides such information as the date of last X ray and the pharmacy services used.

Several Advantages

This approach has provided several advantages, both to us and our patients. For example, much inconvenience to the patient is eliminated, and we realized immediate cost savings in several departments.

In the radiology department, a clerk no longer has to search for the date of a patient's last X ray in a drum Kardex file. Now, when an authorized caller wants that information, the clerk enters the patient's name, Social Security number or medical record number (if known) on a CRT connected to the 370/135.

The information about the X ray (but not clinical data contained in it or a physician's interpretation of it) is retrieved in four or five seconds; previously, this process could have taken as long as half an hour under worst case conditions.

When a patient is admitted to the hospital for the first time, he supplies the necessary demographic data, which is entered into the patient admitting system on the CRT; associated documents are printed on a terminal.

Records are then created for all departments, using the same patient ID. Formerly, each different service within the hospital maintained its own numbers and billing system.

Any service the patient receives is recorded on a Genesis One Computer Corp. CRT located within the servicing department. In this way, all billing information is immediately summarized and available when the patient is discharged. Data on patients is kept for 10 years.

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We have found advantages to our system in the admission, treatment and discharge phases of patient care. In admitting a patient, we find that less time is required and the data we obtain is more accurate.

Also, we can identify bad debt accounts on readmission, as well as notifying the necessary clinical and service departments of the admission.

In the treatment phase, we can provide some basic information about the procedures previously done on a patient, such as what X rays were taken and when. We also provide for interdepartmental identification of patients with a common identifier.

Finally, the discharge phase runs more smoothly. Billing information is immediately available, and insurance claim processing is faster and more accurate.

Blevins is director of DP services at Sparks Regional Medical Center.

Drum Plotter Uses Four Pens

CONCORD, Calif. — A 12-in. drum plotter introduced by Zeta Research, Inc. is said to minimize both CPU and transmission costs via the use of a built-in microcomputer controller.

The four-pen Model 1453 drum plotter includes a 214-character generator, circle and arc generators, dot/dash line generator, programmable pause and selectable scaling and rotation of plots.

The pen drives are capable of 4,000 step/sec, the company said, with a maximum plot size of 11 in. by 144 ft.

RS-232 Interface

Data rates on the device range from 110- to 9,600 bit/sec, synchronous switch-selectable; an RS-232C interface is standard with the unit.

Indicators on the device include error, data, wait and limit signals, with reset and bypass plot switches also built-in.

Options include a step size of .05 mm (standard is .0025 in.), character shading and a larger surface area.

The plotter costs $8,450 from Zeta at 2300 Stanwell Drive, Concord, Calif. 94520.

Free Catalog Sheets Describe Fire Alarms

PAWCATUCK, Conn. — Eighteen catalog sheets recently released by the Douglas Randall Division of Walker Kidde & Co., Inc. detail the company's fire alarm product line.

The literature describes multizone alarm systems, ionization detectors, thermal detectors, air duct smoke detectors and other protection and alarm equipment.

Free copies are available from the company at 6 Pawcatuck Ave., Pawcatuck, Conn. 02891.

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Computerworld Special Report

EDITED BY ANN DOOLEY
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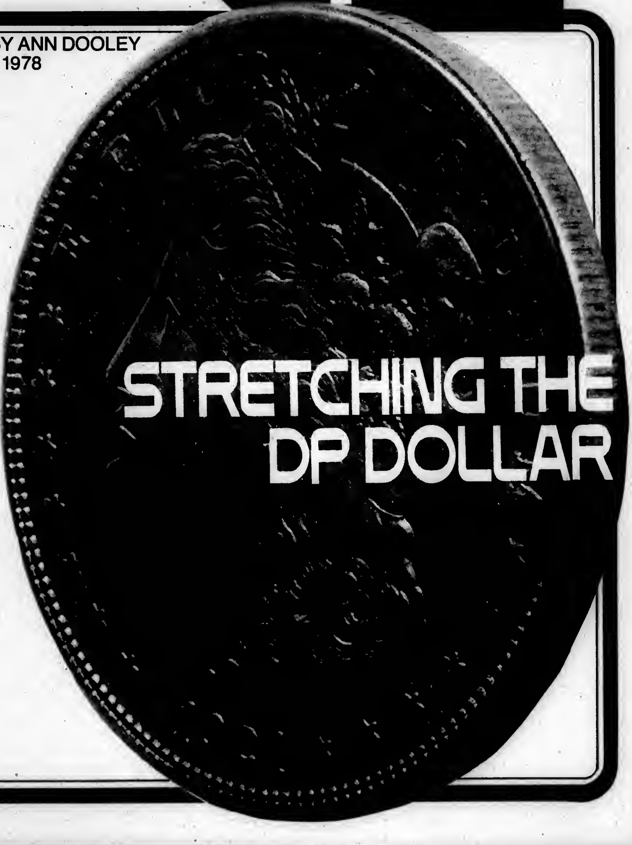

STRETCHING THE DP DOLLAR

DP Function Not Just Technical

Management Principles Can Boost Production

By Richard W. Hoole
Special to CW

When the time comes — as it inevitably does — to hold the line on costs and concentrate on greater efficiency, management all too often thinks of its DP function as a purely technical area, requiring complex hardware and software modifications to increase productivity.

This is not the case. One company has implemented a coordinated management plan which avoids incremental cost increases without forsaking systems development and maintenance.

The key to this approach is the identification of major cost increasing resource utilization.

There are three major cost categories common to all DP departments; each is directly related to a critical resource which must be effectively utilized in order to maximize productivity.

The critical resources and their associated costs are:

- Manpower — the salaries of systems analysts and programmers, operations personnel and data control personnel.
- Hardware — equipment leases, new equipment purchases and maintenance contracts.
- Purchased intelligence — software leases, software maintenance contracts and DP consultants.

A concentrated cost control effort applied to any one of these major resources may not have a substantial impact, since cost control opportunities vary in each company, However, by applying the proper combination of basic management techniques to each of these cost elements, it is possible for any company to control them.

Controlling Manpower

The largest cost element of the typical DP budget is allocated to manpower, making it the prime candidate for cost control. Since human resources exhibit a high degree of variability in productivity, it is here where good management techniques can have the greatest payback.

Within this resource, the system and programming personnel usually represent the largest single expense. Some successful techniques of personnel management include:

- Project time reporting: Effective time management is a trait which all professionals must develop. Weekly reporting against projects which facilitate this and result in less time spent on nonproductive or unassigned tasks.

The spin-off benefits include better project management and reporting.

- Daily time planning: A proven time management technique is the use of daily "To Do" lists. These tend to make job performance more goal-oriented in a short term sense.

The result is more efficient performance of work with less time expended on unplanned and nonessential tasks.

- Staff meetings: When a job seems to exceed the capacity of the staff, try a staff meeting to increase motivation. A little camaraderie (misery loves company) can go a long way to meet temporary surges in workload.

Since the main functions of systems and programming personnel are new systems development and existing system maintenance, output can be increased by modifying these functions. Some simple but proven techniques may be applicable to any company.

First, apply Pareto's Law — which states that one can almost always derive 80% of the benefits for 20% of the effort — to everything. Applied to existing systems, this implies that the majority of the reports produced may not be as useful as a small subset of the reports.

(Continued on Page S/4)

Reaps Programming Payoff

Grocery Applies Care to Package Choice

By Donald R. Landgraf
Special to CW

When a DP center spends money, it wants to buy wisely, choosing products and services that yield high returns to investment. But few users have done as methodical an evaluation before buying as H.E. Butt (HEB) Grocery Co., a 140-store grocery chain in southern Texas. You may be interested in its method — and the results.

The HEB philosophy is simple — in the long run, it pays to take the time to make the proper decision instead of suffering through expensive, bad decisions. The trick comes in knowing how to make a good decision.

HEB identified a need for increased programmer productivity. The management information systems (MIS) department thought a report writer might be the answer, getting users to code their own reports thereby cutting down the time high paid programmers spent coding. But the department didn't know which report writer to buy or even what features the package should have.

They decided to use the Kepner Tregoe (KT) Executive Problem Analysis and Decision-Making Process to search out an answer. KT is a managerial decision-making model marketed by the consulting firm of Kepner and Tregoe.

Objectives Rated

Step one came when HEB project managers sat down together and listed objectives the software package should meet. After developing a long list, they went back and weighed each objective; the most important were rated at 50 and the least important received 10.

Highest ratings went to reliability, maximum productivity, quality of system support, ability to handle all data formats, record selection capabiity, maximum access security, multiple report production with one file pass, efficient use of machine resources and quality of documentation.

Next, certain features were labeled "musts." Any package absolutely had to have exit capability, multiple file processing, IBM file organization handling and sequential and random access handling.

Once the objectives were clear, the group discussed specific proprietary software packages it felt might meet the stores' needs. Some managers had worked with particular packages so they could point out product advantages and disadvantages.

Eventually four software systems were selected for final evaluation: ASI-ST by Applications Software, Inc., Mark IV by Informatics, Inc., IBM's GIS and Pansophic Systems, Inc.'s information retrieval system, Easytrieve.

Product Evaluation

All four vendors presented products to the selection committee, then the packages were installed for trial testing. Two senior systems designers were selected to do the work and report test results and recommendations back to the group. At this point, no one had received formal training for any of the software.

Since ease of use was an important HEB objective, the group decided if a technical programmer couldn't learn to use a package from standard vendor documentation, it would be too difficult for nontechnical users at HEB.

Each package was strenuously tested using a series of sample problems. Easytrieve and Mark IV responded particularly well during this test phase

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To Get Most From DPers, Please Handle With Care

By Ivan Mihail
Special to CW

When a DP installation has to stretch its dollars, it is a warning sign. Either the company is having financial difficulties and top management has finally become seriously interested in the DP function or the DP department is not performing to management's satisfaction.

If a company is in financial trouble, the panic in top management takes the form of cost cutting, and what better place to reduce costs than at the costly and bustling computer center? The DP salaries are usually high compared with other personnel — although management forgets DP skills are unique and in great demand.

DP salaries are high in all categories, but "high" reflects a point of view. In order to attract and keep competent personnel — if not at time of hire, then certainly within one year — the salary and wages must be competitive and therefore "high."

If the cost cutting embraces personnel as well as equipment, chances are there will be an exodus of the most

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On the Inside

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Do-It-Yourself Approach Not Always Best

By **Richard P. Jones**
Special to CW

When it comes to consideration of outside DP service companies, often the answer is, "Please, Mother, I'd rather do it myself." If a company takes this position indiscriminately, however, it may be missing an excellent chance to save money.

The temptation, of course, is to believe it will be less expensive to do the job oneself. But this often results in costly delays, interference with other, perhaps more important, work and regrets later when all the returns are in.

An outside service company's charges are often the least important factor to be considered. After all, quality work does require qualified professionals, first-class equipment and investment in research and development.

There is also a tendency in some cases to overlook a number of internal costs when comparing them with outside service prices. Very often, the greatest cost of doing a job oneself is the cost of more important jobs left undone or delayed.

Under the right combination of circumstances, the use of outside DP services may be the most economical decision. The problem is to decide when this applies and how to select the right service company.

Service firms run the gamut from those that supply raw computer time to those that offer general and special-purpose services, including data base access. Generally speaking, they provide either a supplement to in-house capability or a unique capability.

For Temporary Use

The easiest situation to identify is when extra capacity of some kind is needed for a brief period, such as for file conversion. Similarly, it might be desirable to "farm out" a small application to avoid distraction from more important tasks or to try out a pilot operation before deciding to make an in-house commitment. In such cases, a DP service company could well provide the lowest cost alternative, regardless of the DP capacity of an organization.

In many cases, the unique capabilities of a service company make this the best choice, even though an organization may have a very large in-house shop. The primary rule should be to dedicate in-house capability to the main thrust of one's own business. Simply stated, don't try to be an expert in everything.

Of course a service company may offer a proprietary facility, such as a unique data base. In such cases, the choice is clear if the user needs the information.

More often, however, the decisive factor is specialized facilities and/ot experience. There are implicit economic advantages in using such a service company. For example, if a company has a few employees in every state, it would be extremely costly to automate the payroll and maintain all of the tax modules and so on. It requires the same number of programmers to maintain the tax program for 10 employees as it does for 10,000 or 100,000.

Management Time-Saver

Perhaps one of the most subtle reasons for using outside service companies is to save management time. More often than not, this factor is overlooked when deciding it is "less expensive to do the job in-house." But in reality, it is management that gets involved with interviewing and hiring employees, training, equipment problems and scheduling. Taking on these tasks may represent a severe handicap to the manager who is thus distracted from his primary responsibilities. There is probably no greater cost to a company than lost time of an effective executive.

When the decision is made to consider the services of an outside company, it becomes extremely important to select the one that is best qualified and will provide the best price/quality ratio. This process is not unlike the selection of any vendor.

Perhaps the place to start is to look for adequate stability and depth. Clearly, one wants a service company that can be relied on to stay in business and stand behind its work. Beware of the "have template will travel" companies that may leave the user in the lurch. There is a proliferation of such firms, since it doesn't require a great deal of capital to start some kinds of service companies. Remember that more resources may be required than were originally estimated, and it is important that a company can stand the economic strain.

On the other hand, a company need not be large, only large enough to handle the job in question. And sometimes the most innovative services are developed by smaller entrepreneurial companies. It is advisable, however, to test a small company's abilities on a small job before jumping off the deep end.

It is also important to explore the service company's experience in the particular service you are considering. It may have a great deal of DP knowledge, but does it really have experience in this particular area? If not, a user may be paying for the firm's learning curve and wonder why the system

(Continued on Page S/19)

Continual Inquiry Kindles Growth in Data Entry Area

By **Norman Bodek**
Special to CW

"America wastes 90% of its creative talent" is an opinion voiced recently at a management seminar. The percentage is probably closer to 99% when applied to the area of data entry.

The field of data entry is involved in rapid technological changes in a highly labor-intensive area which places enormous demands on accuracy and timeliness.

Since large sums of money are spent on the capture and control of information, responsible allocation is needed. This is the task of the informed, responsible data entry professional.

Significant savings can be derived from effective data entry management. Only this morning I received a call from an insurance company representative from a facility to over 20 data entry machines. His assignment was to investigate the possibility of converting from keypunch to some other method that could capture and edit the data, as well as replace an existing card computer.

It was astounding that in 1978, this major corporation had not yet converted to a modern, more economical system. Yet, as is often the case, top management's focus was directed toward problems inherent in the central computer system.

This is but one example of inefficient allocation of the data entry dollar.

Five key factors must be examined when attempting to utilize most effectively the monies spent on data entry. These areas cover the method of capturing data, the selection of the best vendor, the role of systems and programming, the utilization of data entry personnel to their fullest potential and the effect of accuracy on dollars spent.

Evaluation of these five criteria can keep the value of your data entry dollar cost-effective.

Data Recording Methods

A number of mature technologies have evolved for efficient recording of data. These include optical character recognition (OCR), key-to-disk, on-line, distributed, voice and others.

The most economical method relates directly to specific goals and available sources of information. Most data entry requires heavy outlays for keying and verification labor. Reduction or elimination of this labor has been a goal.

Optical scanning, for example, almost eliminates direct entry labor, although some keying is required for items not read. There are new combi-

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Under Central Control

Medical Group Mixes Local, Remote DP

Special to CW

ATLANTA — How does a company that has outgrown service bureaus but is still too small for a mainframe computer meet its DP needs in a cost-effective manner? The Medical Association of Georgia (MAG) has solved this problem with its own staff of DP professionals and a judicious mix of in-house equipment and purchased time on a large-scale system.

"We handle data base maintenance, inquiry and small computing jobs on our own machine and run the really big jobs on the remote system," Bob Brown, chief of information systems at MAG, said.

The medical association is the state's medical society, representing nearly 5,000 Goergia doctors. In the early 1970s, MAG and the Georgia Medical Care Foundation (a related organization) had a number of projects under way as a result of government grants and contracts. "Each project manager negotiated his own DP contracts," James M. Moffett, MAG's executive director explained. "We had no central control of DP activities and no way to benefit from potential economies of scale."

MAG also had a number of manual systems such as payroll and membership records that it felt could benefit from automation but which could not be run cost-effectively at a service bureau.

"By 1974," Moffett continued, "I had determined that some type of centralization was needed which would give top management control over the DP activity.'

Brown, formerly with the city government of Atlanta, was hired in the spring of 1974. His first project was the Georgia Cancer Registry, a computerized record of cancer patients at selected Georgia hospitals, operated by MAG under contract with the state government.

"All the Cancer Registry programs

(Continued on Page S/8)

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Management Principles Can Boost Productivity

(Continued from Page S/2)

Cut out some reports, reduce the distribution on others and encourage multiple users of a single report where feasible.

A 30% cutback in operations requirements without any real loss to the user is entirely possible. Try "80/20" on new systems development and solve the major problems for a fraction of the effort.

Secondly, make the user recognize the cost. If a company has a formal chargeback system, the DP managers should make sure it is totally inclusive of all types of programming and special report requests.

Even if the company does not have any formal chargeback policy, it is still possible to estimate the DP cost of all requests and have the requester sign off to indicate acknowledgement. The user will give the request a second thought if he is not fully prepared to justify the cost.

Thirdly, use a phased implementation approach. Rather than tie up all resources in one major new system, break up the development and implementation into smaller phases which are semiindependent. This approach, combined with the 80/20 philosophy, will allow the DP department to give more users most of what they need on a timely basis.

Other DP personnel, such as the operations and data control staffs, generally represent a lesser expense, but still comprise a significant portion of the DP budget. A couple of good cost-saving techniques are:

- Staff only for normal workloads. Computer operations and data control functions are generally cyclical, with weekly, monthly, quarterly and annual peaks.

With the careful utilization of overtime and outside services, these functions can be maintained at a minimal staff level without excessive risk.

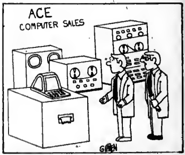
- Avoid rerunning jobs. How often has a neglectful instructional error or a seemingly obvious data entry error resulted in rerunning a long job? If processing time is any kind of constraint in a company, a DP manager will find it very beneficial to try improving documentation, scheduling and data control procedures for the operations staff.

More Hardware Efficiency

Getting more for the hardware dollar can involve some complex methods, but there are also some simpler techniques.

Use more capacity. A 24-hour day in Operations can delay the need for better hardware, and it does not cost a whole lot.

Streamline programs. If there is a hardware constraint, make existing programs more efficient. Try combining programs or making logical improvements in job streams.



'We'd Better Take This One ... It Says It's a Good Friend of Darth Vader.'

This is excellent training for programmers and will improve future systems development as well as having immediate capacity benefits.

When the DP budget gets tight, it is easy to put a hold on additional software or DP consulting expenditures. However, the application of some managerial common sense may even allow some reductions.

Some potential ways of cutting costs are:

- Review maintenance contracts. If significant in-house modifications of a purchased software package have been performed, a user's version of the package may not benefit from a maintenance contract.

If vendor-supplied package upgrades no longer are readily usable to the user's version of the software, he may be paying for maintenance he will never use.

- Stop paying for white elephants. If a user looks hard enough, he can find a piece of software which is being leased but not used in most DP departments. For instance, one company had been leasing an RPG-II compiler, but did not employ any programmers who knew the language.
- Identify discretionary expenses. All DP departments have some expenses which can be immediately cut back without affecting the performance of the department's functional responsibilities. These should be identified and reviewed.

Care should be exercised, however, since some discretionary expenditures actually save money.

All of these cost control techniques require minimal understanding of the DP function. They are examples of basic management analysis.

The logic supporting these methods would apply to any department; they are not DP-oriented, which is the key point here.

When it comes to stretching the dollar, try some good business management first.

Hoole is a consultant with Pittiglio, Rabin, Todd & McGrath, a general management consulting firm in Burlington, Mass.

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Draw Limits Early

Organized DBMS Search Can Bring Savings

By Donald R. St. Clair
Special to CW

Suppose an organization has decided to adopt the data base approach to designing, implementing and operating its applications. Management is aware of the potential benefits as well as the possible pitfalls involved and supports the move. The task now is for that organization to select a data base management sytsem (DBMS) to best support its data base activities.

The job facing any organization at this stage is large and complicated and the approach taken will be a major determinant of how smooth the road to data base is.

There are a large number of data base support software alternatives available, but one seldom stands out as clearly superior to the rest. Since the cost of developing or acquiring a DBMS is typically very substantial, a thorough evaluation is required. Any investment made in this evaluation which helps to predict how well the software will support a user's data base activities will pay large dividends when the system is in use.

The time and effort required to thoroughly evaluate the viable alternatives available can usually be reduced by limiting the scope of the evaluation early in the process. In most cases, developing a DBMS in-house is not an efficient approach because of the effort required and the quality of the systems offered by hardware manufacturers and independent software vendors. Similarly, it usually is not worth converting a system which is only offered for noncompatible hardware.

Therefore, the range of practical choices can usually be limited to commercial DBMS offerings available for a user's particular hardware.

Consider Basic Objective

From this point, there are many good techniques for rating and scoring the systems available to an array of evalution criteria. While these have the appeal of introducing structure and objectivity into the DBMS selection decision, they can also let the user lose sight of its basic objective.

The basic aim of the DBMS selection actvity is to identify the system that supports the data base goals of the organization for the least expenditure of time, effort and dollars. Since every organization's goals differ somewhat, no single list of evaluation criteria will suit every evaluation. It also follows that no one DBMS will provide the best support for every organization's data base effort.

The basic conclusion to be drawn is that there are no easy answers. The evaluation must be thorough but should also be as brief as possible. Many DBMS selection decisions have been "studied to death" because the evaluation team lost sight of the DBMS selection objective. One way to avoid this is to establish a selection strategy and follow it closely.

To meet the DBMS selection objective stated above, you should evaluate only those factors that help predict how well the DBMS will support your organization's data base goals. This places the emphasis on evaluating how well the package will support your goals rather than on how well it meets its designers' goals. With this approach, it is easier to assess the relevance of the various vendors' claims and to avoid unnecessary evaluations.

The key to using this strategy is to first determine and document the objectives that were established for the organization's data base effort. These are the reasons management decided to adopt the approach. Typically, these objectives are similar to the following.

- Increase analyst and programmer productivity in the development and maintenance of applications.
- Control the definition and use of data.
- Integrate data to provide consistent and easy access to multiple applications.

Document Goals

Whatever the objectives may be, they should be documented and used to guide every step of the evaluation process. All evaluation activities should be directed toward determining the effectiveness of each DBMS in supporting the organization's achievement of its data base goals. If the study and rating of some feature does not help to determine this, it should not be done.

When this strategy is used to evaluate the DBMS alternatives, several basic guidelines can help in arriving at a good choice with minimal effort:

- Concentrate on evaluating the DBMS features that increase analyst and programmer productivity. This is usually the primary objective of a data base effort and, therefore, should be given the greatest attention in the evaluation. The benefit comes in only evaluating those productivity features your organization can be expected to take advantage of. Avoid evaluating capabilities which are valuable to other users, but will not be used by your organization.
- Concentrate on evaluating DBMS control facilities. This is an area which is usually very important to the organization and often provides a primary

(Continued on Page S/10)

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Plan Lets School Handle 43%/Year DP Growth

By Raff Ellis
Special to CW

PITTSBURGH, Pa. — Holding down costs in computer operations has not been easy during the past several years, what with rampant inflation, competition for qualified personnel and the pressures of continued growth for computer services.

At universities in general, and the University of Pittsburgh (UP) in particular, these problems have been compounded by tightened fiscal spending both at local and federal levels. In 1970, UP decided to hold the line on computer center spending and to adopt the "level budget" concept.

Since that momentous decision was made, actual computing (measured in standardized units) has grown at an annual compound rate of 43%, with usage peaking at a rate 20 times higher than the 1970 level. This growth was accomplished within the stated budget goals.

Not possible, you say? Well let us examine how it was done.

First of all, there is no magic involved in cutting or avoiding costs. What is required is a cold, hard analysis of expenditures, sprinkled liberally with a dose of common sense, tempered with an evaluation of risks and followed by development of a plan you are committed to make come true.

The most obvious area to start with at UP was the equipment expense. Consuming some 60% of the total budget, the computer center's equipment consisted of two leased IBM 360/50s costing approximately $65,000/mo and an owned IBM 7090.

Since capacity badly needed to be upgraded, a study of alternatives was undertaken to increase capacity by 100% at a minimum.

A compatible solution — the acquisition of a machine such as an IBM 370/165 — would have nearly doubled costs. At this point, the administration was asked to borrow money for equipment purchases which would allow lease dollars to be translated into mortgage payments over a five-year period.

Simple interest calculations showed $2 million borrowed over five years at 8% would cost approximately $42,000/mo. Assuming maintenance costs of $13,000/mo, the total cost of an upgrade would leave credits of $10,000/mo, for conversion costs and expansion of other services such as remote job entry stations and timesharing terminals.

After a detailed study of equipment alternatives, Digital Equipment Corp. was selected as the primary equipment vendor and a phased acquisition was begun which led to the installation of four Decsystem-10 central processors. These units were configured into two dual Decsystem-1055 systems and by June 1972 replaced the IBM CPUs.

By December 1973, these systems had been upgraded to Decsystem-1077s giving the center approximately 10 times its original capacity at the same cost.

The interesting feature of the scheme was that as lease dollars were freed up, more purchasing leverage was gained. Also, when the mortgage expired, equipment salvage value and budget credits allowed further upgrades without increased expense.

By the end of the program, the only leased equipment was tape drives and keypunches. Significant savings were accrued by purchasing terminals instead of renting them, and these monies were used to add terminals.

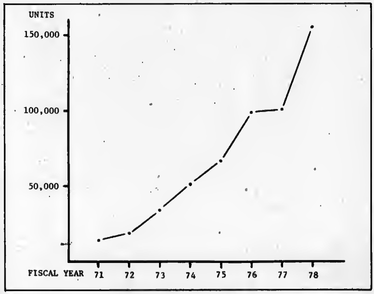
In late 1977, after all current debt was amortized, UP upgraded its equipment to Decsystem-1099s, creating a capacity approximately 20 times that of 1971.

Supplies Cost

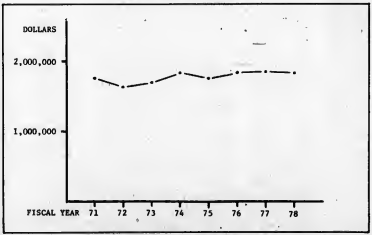
As usage began to grow in response to the increased capacity, supplies consumption also grew. The university's high-volume environment calls for more than 100,000 batch runs monthly.

The principal supplies cost is paper;

(Continued on Page S/20)



Annual Computer Unit Usage



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CONTROL DATA
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More than a computer company

Medical Group Mixes Local, Remote Processing

(Continued from Page S/3)

were written in Cobol and most required extremely large amounts of main storage," Brown noted. "It would have been almost impossible to convert them to a small business system," he continued.

"To make matters worse, all the DP money was in the form of 'soft funds' (grants and contracts), so there was no way to make any capital expenditures," he said.

Because of MAG's educational and nonprofit status, Brown was able to negotiate the purchase of time on Emory University's Univac 70/7 (upgraded to a Univac 90/8 in 1977) and a remote terminal to Emory's system was installed in the MAG building.

The Univac VMOS operating system (now VS/9) has an ANS Cobol compiler, and its virtual storage feature eliminated worry about large program sizes. Even more important in terms of getting the system up and running quickly were the interactive file editor and the ability to initiate batch jobs from the remote terminal. "With the computing center almost five miles away, it would have been prohibitively expensive to have to submit jobs as card decks," Brown said.

At about the same time, Moffett and Brown began the development of an in-house analysis and programming staff. According to Moffett, "Service bureaus are fine for running established systems and doing routine maintenance, but for a heavily development-oriented organization such as ours, an in-house staff is likely to be more cost-effective."

Cancer Registry Subsystem

Paula Reith joined MAG's staff as an analyst/programmer and was immediately given the task of designing an input/output entry subsystem for the cancer registry project. "The complexity of the data dictated a need for some editing at the time information was keyed, and considerations of patient confidentiality ruled out subcontracting the work," Reith explained.

Not only was the cost of on-line entry to the Univac system quite high, Reith felt that the low 300 bit/sec line speed would adversely affect production rates. Accordingly, she decided that data should be entered and edited on a programmable terminal, then recorded for batch transmission to Emory at night. After extensive evaluation, Reith selected the Datapoint Corp.1108 for this function, based on equipment suitability and hardware/software support.

"This was our introduction to the concept of mixing local and remote computing," Brown said. The concept worked so well that MAG has upgraded its Datapoint equipment twice. It now has a Datapoint 5500 processor with magnetic tape unit, 75M bytes of disk storage and 12 local terminals.

"We use the Datapoint system for data entry, data base maintenance, inquiry and small computing jobs and run the number-crunching jobs on the Univac system at Emory," Brown explained. New applications are put on the Datapoint system whenever feasible, but Brown and his staff don't hesitate to use the Univac system when it is better suited to a particular task.

MAG's Information Systems bureau is currently handling administrative and financial DP, including payroll and general ledger applications. Since 1975, it has operated a membership information system which includes dues billing and accounting, membership card preparation, a mailing subsystem and the preparation of a computer-typeset roster of members.

Other projects include a 70,000-name patient data base and microfilm record index and a Medicaid claim review system developed for the Georgia Medical Care Foundation. The cancer registry is still in operation serving 24 Georgia hospitals.

Over the past three years, MAG's Information Systems staff has provided DP support to a half dozen other research, development or operational projects.

Brown credited this outstanding productivity to an exceptional staff and careful make/buy decisions in software development. One of the first large investments MAG made in the DP field was to license Pansophic Systems, Inc.'s Easytrieve reporting package. Brown called it "one of the best investments we've ever made," adding, "It's easily the equivalent of having another programmer on the staff."

Similarly, the payroll and general ledger systems started out as purchased packages, with in-house-developed custom programs being added as necessary to meet the needs of the user departments. "Starting with packages enabled us to bring the systems up quickly; the benefits of custom programming were deferred but not eliminated."

MAG's pride in its Information Systems staff appears to be justified; in the four years the program has been in existence, not one analyst/programmer has left. Moffett attributed this to the willingness of MAG's board of directors to recognize that providing appropriate salaries to existing staff members is less expensive in the long run than constantly training new ones.

Brown credited the high productivity and relatively low budget of MAG's DP organization to three factors: a judicious mix of in-house and remote hardware, careful decision-making in the software development process and a highly-competent and well-motivated staff.

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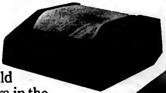
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Cuts Software Changes

Controller Helps Firm Save on Net Expansion

By Allen S. Rosin
Special to CW

CHICAGO — Selecting proper peripheral equipment to extend the functions of its existing DP facilities has provided an immediate savings of thousands of dollars for the Superior Tea and Coffee Co.

As a nationwide distributor of specialty teas and coffees to the restaurant industry, the firm has six distribution points around the U.S. each maintaining an inventory that must be ready for prompt customer delivery.

A few years ago, Superior began developing several on-line applications for many of its everyday business functions including inventory management and route accounting. These applications were originally designed for use at the Chicago headquarters, and the company installed a small cluster of terminals locally attached to its IBM 360/40 in the data center for that purpose.

As the applications were implemented, it became obvious there would be a need for terminals in remote offices, but this presented several obstacles. The application software was designed for local terminals, and Superior did not have an appropriate front end for its 360. It really could not justify the investment to make these changes.

Fortunately, Superior was able to find a solution which allowed it to add remote terminals at regional locations without changing software or installing a front end.

The results of this program have been very successful, and the distributor has found that the use of these terminals provides savings and expanded capabilities throughout its business operation. Consequently, the network has grown well beyond the original expectations, and prospects for continued savings are so encouraging that the purchase of additional equipment is expected to lead to a further reduction of business and DP overhead.

The product Superior chose for this network expansion was ITT Couriers Virtual Terminal Line Controller (VTLC). The initial savings upon installation was approximately $20,000, and the VTLC has given the firm's six divisions instant access to information contained in its central data center in Chicago.

Hybrid Device

The VTLC, a hybrid device the company uses as a local terminal controller, a remote line controller and a communications processor was easy to install and has proved very versatile. Each of two VTLCs is connected to the byte multiplexer channel on Superior's IBM 360 and supports up to 32 remote or local terminals. Because it functions as both a local terminal controller and front-end processor, the VTLC eliminates the need for these two separate devices.

The capability of the VTLC to make each remote device (CRT or printer) appear local to the CPU has given Superior most of the cost-saving benefits. The mainframe "thinks" the VTLC is an IBM 3272. Now offices in Los Angeles, San Francisco, Atlanta, Detroit, Hainesport, N.J., and Elkgrove, Ill., are brought into a local environment and have the same capability as the Chicago headquarters.

Each of Superior's divisions has at least two Courier CRTs and printers linked to a remote terminal controller (RTC). By pressing just two keys, any division can obtain a display or printout of information on sales or receivables as it stands at that moment. Prior to the VTLC installation, it took at least two days to compile the same information.

Previously, a terminal could be a maximum of 2,000 feet from the central computer. But with the VTLC, the distance can be 2,000 miles or more without a change in software. Since no remote communications software was needed, the demand on mainframe memory was minimal. The savings are obvious.

Invoicing, accounts receivable, warehouse inventory, payroll and other accounting systems are now at the fingertips of every division. In total, 60 displays and printers are spread around the country, operating with five RTCs. Next year, Superior plans to add 10 more CRTs with the money saved since the installation of the VTLCs just 10 months ago.

In recent years, coffee prices have fluctuated frequently. Use of the VTLCs gives buyers and sales personnel in each division a competitive edge by providing up-to-the-minute coffee prices. Price information can be requested by any of the remote or local displays or printers. Incoming prices from any of the divisions can also be fed through the system for all divisions.

Phone Lines Monitored

Using its utility packages, the VTLC can also monitor phone lines and warn of any problems or breakdowns. In 30 seconds, an operator at any of the remote terminals can take a line out of service or achieve the necessary line switching, which would otherwise take several hours.

This feature of the VTLC allows for

(Continued on Page S/20)

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Grocer Puts Careful Review to Package Choice

(Continued from Page S/2)

so the analyst decided to run both in a live environment, turning out production reports for the HEB corporate accounting department.

While in-house testing continued, several other evaluation procedures were in process. All four vendors were given questionnaires asking how their software packages met each specific HEB objective. Vendors responsed in writing to HEB. In addition, each vendor was asked to supply a list of three current users who could be contacted as references.

And that's exactly what HEB did. Not only did it systematically call each user, but it asked a standardized series of questions about the user's experience with the package. The responses were recorded for each product and summarized in a report for the evaluation committee.

After several weeks of testing, a one-page analysis of each package was prepared for group discussion. Ease of use, documentation, performance, ease of installation and throughput speed were evaluated.

Each package was ranked according to its success in meeting the list of objectives. As before, the package that most successfully met a particular objective was given a higher score than the other three packages.

At this point, GIS was dropped from the evaluation; it did not meet three of the seven "musts." Then, the remaining packages were each given a final numerical score.

On the basis of this numerical ranking, ASI-ST was selected for purchase. However, this was not the end of the HEB evaluation.

The KT decision process recommends that once an initial decision has been reached, the decision maker assess adverse consequences of that choice. So, the committee reviewed its selection.

During this final analysis, it realized it had just selected not a report writer, but a full-blown developmental system. It was time to go back and decide if they wanted this total change or if a straightforward information retrieval system would be preferable.

The concept of a report writer was enthusiastically supported; thus, ASI-ST was not selected for purchase after all. Mark IV was also discarded because it was expensive and difficult for HEB users.

Instead, the group discussed buying Mini-ASI-ST or Easytrieve — the only two logical remaining choices. Each report writer was excellent and could do most of the tasks HEB needed. How was the final decision to be reached?

Final Review

The group went back to its initial list of objectives and started reviewing each package, point by point. Technically, both software packages stood up against committee scrutiny. But in the end, Easytrieve was selected because it is specifically geared to the nontechnical user — from the start, an important HEB selection criterion.

Since the day of final decision, Easytrieve has boosted HEB productivity. More and more users, technical as well as nontechnical, are learning to use it just as the selection committee intended. In fact, this thorough evaluation all but guaranteed HEB would make the best purchase decision for its data center.

Landgraf is vice-president of marketing for Pansophic Systems, Inc.

Organized Quest Boosts Savings

(Continued from Page S/5)

reason for placing data into a data base. In many cases, the control facilities supplied by a DBMS and its associated data dictionary are among the most important evaluation criteria.

Realizing this early in the evaluation process can save time and effort by allowing the investigation to be focused on these most important factors. Failure to properly evaluate these facilities can result in selecting a DBMS which cannot effectively support the data base objectives of the organization.

- Evaluate the technological sophistication of a DBMS only if it is required to meet the organization's data base objectives. A large effort is required to properly evaluate the competing approaches to record storage, internal control structures and similar features.

In most cases, any DBMS which works well and has a strong user base will have adequate technological sophistication to support your organization's data base effort. The marketplace and commercial reference services can be used to provide this evaluation in most cases, and the package can be accepted for further evaluation with minimal investigation of these areas.

These guidelines should help to reduce the effort involved in evaluating the various DBMS software packages available by emphasizing the need to avoid comparisons of factors not relevant to the effectiveness of the package in the organization.

A clear statement of the reasons for adopting the data base approach will show what is required of a DBMS and, therefore, what must be evaluated. By relating every step of the evaluation process back to these objectives, a thorough evaluation can be made with a minimum of effort.

St. Clair is manager of the Midwest data base consulting group for Deloitte Haskins & Sells in Chicago.

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Supports Complete Systems

Third-Party Service Cuts Repair Pandemonium

By George Harmon
Special to CW

Computer systems are becoming less expensive, but at the same time, their service and maintenance are consuming larger chunks of users' budgets — up to 20% more — than is actually necessary.

One problem is that users rely on too many "specialists," each of whom services only a small portion of a total system.

The best solution is to use a third-party service organization capable of maintaining and supporting complete systems.

Consider the following scenario: A mainframe mysteriously shuts down and the DP manager cannot determine the part of the system causing the malfunction. It is essential that the system come up again as quickly as possible. Therefore, service representatives from the various system component manufacturers are called in to locate and solve the problem.

In sequence, service reps from the mainframe manufacturer, the printer supplier, the CRT maker, the tape drive company, perhaps a software vendor and even the supplier of the interface devices come in to isolate and rectify the cause. As each rep fails to locate the problem, blame for the malfunction is shifted to another subsystem.

After many hours of deliberation by an army of different service reps, it is determined that the defect is caused by yet another source — the telephone lines.

Significant Losses

In the meantime, however, the DP manager has paid dearly for this downtime since each of the service reps charge as much as $80 per hour for the emergency call. These costs — coupled with the intangible losses resulting from system downtime — add up to a significant total.

Most of the aggravation and the expense caused by this hypothetical malfunction could have been avoided by using a third-party service organization.

For example, instead of having to wait for the different reps to service each piece of equipment, one customer engineer (CE) from a third-party service firm could have inspected all the components within the system and determined the malfunction. This would have eliminated the extra costs of having two or more people working on the system, since the user would only pay the service rate of the third-party firm, which typically may be 30% less than that of manufacturers' reps.

(A manufacturer's rep will only service specific, represented equipment. On the other hand, a third-party service CE could conceivably service and maintain the total system.)

Ultimately, a third-party agreement could lead to shorter periods of system downtime. One person knows all the components and can troubleshoot anyone's equipment and then repair it.

Factory Backup?

But, are third party customer engineers given the same factory backup and technical aid as the manufacturer's rep?

The answer is yes. In addition to being trained in the operation and servicing of certain manufacturers' products, each CE can also call upon those manufacturers' factory support staffs if additional assistance is necessary. More help, then, is a phone call away.

A suitable comparison exists within the medical field. When people feel ill, they usually go to a general practitioner. Should the problem be out of the scope of his expertise, a specialist is called in for assistance.

The same is true with computer servicing. If a third-party CE fails to locate the problem within a system, the manufacturer's factory is called for assistance.

In terms of user advantages, the CE, in servicing a variety of products, provides a wider range of technical expertise than the manufacturer's rep who services only one device.

Third-party servicing is also beneficial in terms of periodic system maintenance. Instead of relying on a cadre of manufacturers' service reps, a user need only call one person to do the appropriate inspection and refurbishing.

Possible Misconception

In the minds of many users, entering into service agreements with equipment manufacturers, although more expensive, has been the safest way to assure a system's operation. Their thinking is: "Why gamble? I have an XYZ Corp. system, so why not use XYZ service?" But this could represent a grave and costly misconception that might add unnecessary cost and delays.

The old cliche, "Time is money," is most appropriate when applied to third-party service. With a properly negotiated contract (one in which the user retains ultimate control over what is needed), users will minimize the amount of system downtime and realize a considerable savings in service costs.

Harmon is vice-president and general manager of the PCC Service Division of Pertec Computer Corp.

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To Get Most From DPers, Handle With Care

(Continued from Page S/2)

competent and alert personnel — they know how to read the signs.

Steps to Improvement

If we assume the financially troubled company has a tolerably enlightened management and is in trouble because of general economic conditions and not because of a poorly functioning DP department, there are a number of measures which, when intelligently implemented, will result in improved performance.

The first step is to eliminate all non-DP functions performed by the data center such as clerical, editing and control functions, which properly belong in the accounting or user's departments. Management's attention should be directed at the reports generated and whether they are really necessary.

The next step is to offer to others DP services, rent out excess machine time — provided the computer is underutilized — and question whether any overtime is justified.

Finally, it should be determined whether the equipment upgrades are motivated by the DP manager's desire to enhance his marketable skills rather than meet company needs, in which case a restructuring of the configuration may be indicated.

Attention to People

Personnel considerations, however, should have top priority in this reappraisal. The DP manager wants the computer center to function efficiently and to meet the schedules. In many respects, he has become a production manager, and the computer installation is the factory moved into the office. Hence, it must process data with minimum interruption.

The DP manager strives to meet the computer's needs, and the only time he concerns himself with personnel is when someone quits (then replacement is sought as of a missing or defective part), when someone is fired or when someone asks for a salary increase.

Personnel considerations are pushed in the background by the exigencies of production schedules.

When a person is hired, the interview is limited to technical competence only. When a person quits or is fired, there is usually no exit interview to ascertain the reason for the departure — the most valuable function a manager can perform.

This perpetuates the predominant impression of most people who come into contact with a DP installation for the first time — that is a cold, impersonal and threatening place.

However, if the DP manager addresses the personnel factor from the start, then well-motivated and productive employees will be kept, ensuring an efficient and cost-justified installation.

As we all know, after six months to a year, keypunch and systems operations tend to get monotonous. An alert manager must be people-oriented. He must look for ways to make the job more interesting — or at least palatable.

Employees Need Care

A manager manages people, not machines. Just as a computer performs better in a good environment — with adequate air-conditioning and humidity, for instance — so do people.

But people require more care and consideration since they supply the real driving force. Ideal physical working conditions help morale and productivity, but they do not ensure it.

The DP employees must be regarded as individuals — *important* individuals. Every employee has the need to feel important. Employees do not want to feel they are at the bottom of a heap.

In addition, they should be aware of what is required of them. Data entry operators want to know the expected number of key strokes per hour. Programmers need clear problem definitions and reasonable schedules. Operators require proven procedures and documentation, as well as reasonable schedules.

From personal experience I have observed that keypunch operators perform much better when the jobs are well-structured. For example, in billing or order entry, the source document is designed with keypunching in mind. The sequence of keypunching steps matches the sequence of the source document entries (of course, not 100%).

Also, jobs should be varied. One employee should not do all the keypunching and another all the verifying.

Another important factor is the knowledge of job priorities. More effort should be expended to define and maintain these priorities. Nothing is more disconcerting than a constant flip-flop in directives and I've found an extra break helps in keypunch operations.

Supportive Environment Helps

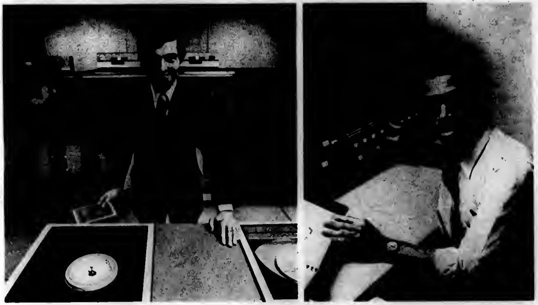
Generally, we pay less attention to personnel considerations as we go down the ladder, whereas it should be the reverse. I have heard many DP managers brag that they saved company money by buying cheaper core, peripherals or supplies. If they are judged by that criteria, I feel sorry for them.

Enlightened management must be concerned with developing the kind of environment most conducive to eliciting high levels of performance. An environment must be created in which a person feels important and comfortable.

People thrive on praise. Employees

(Continued on Page S/13)

Is SORBUS service better for manufacturers or end-users?



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Continual Inquiry Kindles Data Entry Growth

(Continued from Page S/3)

nations of OCR and key-to-disk systems to investigate.

If the scanner can read the document, there should be considerable savings over keying. Many applications of this method have been successful to date.

Key-to-disk has eliminated cards and related handling costs and reduced strokage. It has also eliminated the recycling of errors.

Other Options

Unlike key-to-disk, on-line data entry usually eliminates the need for any rekeying. With on-line, the operator interacts directly with the large computer data bank for each transaction.

Distributed data entry brings data capture closer to its source. People entering the data, who are familiar with the source material, may not need to rekey.

The method of recording data should be chosen according to how well it meets the existing and projected needs of the company.

Ideally, a user should select a vendor which understands company needs, offers equipment that meets these needs can expand efficiently to handle growth. The vendor should be able to respond quickly when needed.

The increasing use of computers in daily activities has radically changed the fabric of American society during the past two decades. Ironically, management is often reluctant to replace outdated equipment with an improved system. This resistance to change is exemplified by the continued use of the 80-column IBM card.

Utilizing programs over a period of time leads to increased speed and accuracy. Constant change in this area would vastly increase the net worth of the programs.

The question should be handled by the data entry professional, who can ensure the best systems are utilized to full capacity.

Motivation is key factor in realizing the fullest potential of data entry personnel. Persons who operate the machines are not extensions of the computers.

Educational Programs

Investing in educational programs and promotional incentives is likely to increase productivity in the short term and, in the long term, furnish the corporation with future data entry management.

At the managerial level, a tendency toward restrictive patterns should be avoided. As many people as possible should be trained to function in as many capacities as possible. Flexibility and growth among personnel stretch the data entry dollar.

Clever approaches, aimed at increased accuracy and reducing strokage, have been developed.

The approach to accuracy should be based on need — 100% verification doesn't mean 100% accuracy. Even with 100% verification, errors occur.

Each job should be evaluated separately in order to determine which fields require verification. If time and effort are wasted maintaining an insignificantly high level of accuracy, the data entry dollar has not been wisely spent.

The best way to stretch the data entry dollar is to motivate the data entry professional to strive for excellence. An attitude rooted in continual inquiry produces positive change and improved technologies.

Bodek is president of the Data Entry Management Association, based in Greenwich, Conn.

Care in Handling Of DPers Urged

(Continued from Page S/12)

don't mind constructive criticism, but they don't want to be treated like nobodies or unequals. How do you make them more productive?

- Make them feel part of the team; build an esprit de corps.
- Be alert to their opinions and suggestions — it's vital feedback.
- Be fair and understanding.
- Delegate responsibility; responsibility equals importance. (Just try to recall how you felt when you were given some responsibility and were praised for a job well done).
- Be patient. Your job is to be a leader, not a driver.
- Help them grow and develop. Every job can be done better when recognized and rewarded. Constantly reevaluate performance with objective standards; it pays off.
- A performance bonus is the best incentive for doing a better job at any level.

Hire Enthusiastic Beginners

There are other ways to stetch the dollar through personnel considerations. Sources exist for entry-level personnel who may be hired at a reasonable rate provided one wishes to invest in some training.

Some high schools and colleges now provide comprehensive DP courses. I have used some of their top graduates and been impressed with the quality and quantity of their work.

However, the long-run consideration for a DP manager must be developing well-motivated, competent, productive employees by building an esprit de corps as well as recognizing their importance and praising their contributions.

Mihail is DP manager of Germain's, Inc. in Los Angeles.

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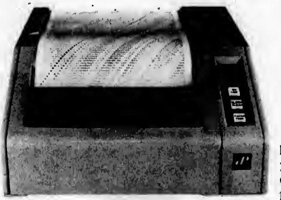

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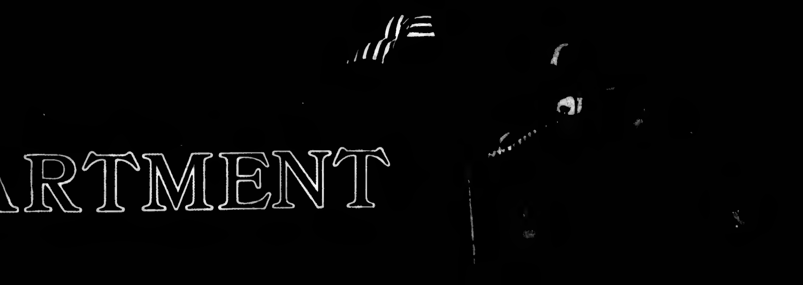


Weigh Pros and Cons

Build or Buy Software? That Is the Question

The process of determining whether to build or buy software requires a careful evaluation of relative costs, time and derived benefits. The end user must be fully aware of the direct and indirect costs involved in both in-house development and outside purchase agreements. First, certain basics must be understood.

In most cases, in-house software development projects take several months to several years to complete and are subject to delays growing out of manpower requirements, technical expertise, machine time requirements and changing user specifications. Purchased software, on the other hand, is frequently more quickly installed and can become operational within a fraction of the in-house development time frame.

DP management has come a long way in its ability to cost out in-house development efforts, but rarely does the completed product reflect the original cost estimate; usually it considerably surpasses it.

Purchased packages, in comparison, ordinarily have fixed prices and therefore allow management to project its annual DP budget more accurately.

Pros and Cons

Historically, systems developed in-house are poorly documented and sometimes depend entirely on the memory of a single individual. Should he cease to be available, documentation may no longer exist.

With purchased packages, the vendor usually supplies complete, well-structured documentation and frequently makes available source langauge coding for user modification.

In practice, in-house efforts tend to be less flexible than purchased software. If a purchased package does not exactly meet one's needs, it can often be modified without difficulty and occasionally can be fitted into multiple phases of a larger system or application.

Questions to Answer

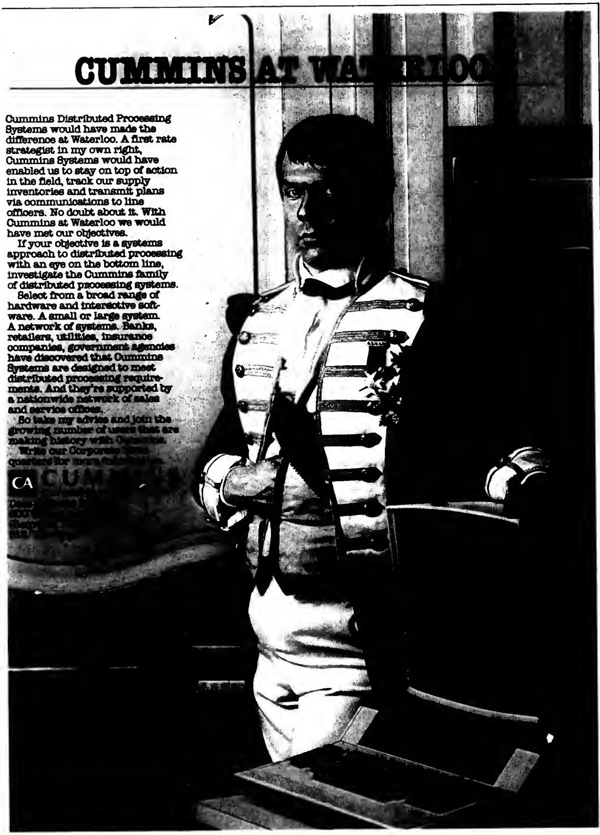
To analyze fully the "make or buy" criteria, an investigative process must be initiated before the search for a specific package begins.

Some questions the investigative group (or DP manager) should seek to answer are listed below. Keep in mind, however, the objective is to weigh need vs. cost:

- What does the company need to get the job done?
- If this effort were carried out in-house, what would it cost?
- Does the company have the personnel to do it in-house? If not, what would it cost to get such personnel?
- If the company hires the necessary staff, what happens with it after the job is accomplished?
- How long will it take to develop, debug, test and document the effort?
- How much machine time should be allowed for this effort? What will this cost, and what effect will this machine usage have on other projects under development?
- How much maintenance, in terms of manpower and machine time, must be allocated to this effort — more than a year? Longer?
- What long-range enhancements, based on company growth, can be reasonably anticipated? What will these cost?
- What software is on the market that will meet both immediate and long-range needs? What do these packages cost?
- What is the source language?
- Does the package conform to the hardware configuration?
- Will additional hardware be needed? What will this cost and how much time does the company have to acquire it?
- How well known is this product?
- Where is the vendor located? How quickly can he provide service?

In meeting with vendor representatives, the following points should be covered by

(Continued on Page S/26)



Cummins Distributed Processing Systems would have made the difference at Waterloo. A first rate strategist in my own right, Cummins Systems would have enabled us to stay on top of action in the field, track our supply inventories and transmit plans via communications to line officers. No doubt about it. With Cummins at Waterloo we would have met our objectives.

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Redesigned Form Saves Printer Time, Paper

By Gary J. Elliott
Special to CW

MIAMI – One mile of paper – that's what has been saved in a year's time by redesigning just one form at Associated Grocers of Florida, Inc. (AGF). Add to that a reduction of 9% to 10% in high-speed printer time and the dollar savings become well worth the effort put into the project.

The pressure-sensitive picking labels which we attach to the thousands of cartons of grocery products that leave our premises daily for delivery to customers were the subject of the improvement. An increase in business volume over the past several years emphasized that we were using a lot of valuable high-speed printer and computer time to process the labels.

We consulted with our forms supplier, the Standard Register Co. and its representative figured a way we could reduce the length of the continuous form being used.

The AGF, close to 30 years in business, serves independent grocery stores (members) ranging in size from "Mom-and-Pop" stores to supermarkets in southeastern Florida. Our area ranges from Key West north to Vero Beach and then over to Lake Okeechobee. We also serve customers on the Gulf Coast in Naples and Fort Myers. We have an export department for the Bahamas, Virgin Islands and a few customers in South America.

Altogether, we serve about 525 active stores and several restaurants. From 1976 to 1977 we used about 12 million picking labels, but we estimated a need for about 20 million in 1978.

The old form measured 14-1/2-by 10 in. with 32 labels mounted 2-wide, 16 per side. Each label was independent and separated from its fellows by horizontal and vertical perforations.

With some astute forms design work, Standard Register's specialist has cut 1 in. off the form's length while leaving it with 32 labels. That 1 in. accumulating for one year adds up to a savings of about one mile of paper and a lot less computer processing time.

The solution was to reduce each label's depth by 1/16 in. and butt cut them for vertical mounting in pairs. We remain with 32 labels per page, but the page is only 9 in. long now. Horizontal perforations divide every pair of labels from their neighbors.

The 1/16 in. cut in label depth does not effect the printing operation, other than time reduction. We still use an 8 line/in. measure, printing every other line. All the necessary information can still be entered – brand name, description, invoice number and identification number on the top line; slot number indicating warehouse location, quantity, case code, pack amount, size, date, our item code number, store number and suggested retail price on the second line.

Increasing Efficiency

This is just another step we have recently taken to increase efficiency and reduce costs in DP and paperwork areas. Previously, for example, we had a continuous form that combined an order's invoice with the picking labels.

We found this process to be inefficient and costly since one line entry on the invoice side might require 25 or more labels. Also, labels could be mounted only on one side, the other side being the invoice.

In this case, we reversed the usual concept of simplification and split the form in half to obtain necessary efficiency and savings. We find it faster and much less costly to print separate invoice and label forms.

The invoice is a one-part continuous form printed 2-wide in two colors – a pink side retained by us and a blue side for the member store. It is an attractive and practical form with every other 4-line section screened in the appropriate ink color to make for easy reading.

Additionally, our logo appears in the center of each side in slightly darker screening. All the items important to the customer are outlined.

The statement form, another one-part continuous document, is divided into three sections across: on the left, the statement itself; in the middle, a stub section to be returned with payment; on the right, our office copy. Export shipment requires an 8-part invoice form because of customs and forwarder needs.

All these forms are processed the same day shipments are made so the invoice and statement copies can be sent to the customer with a shipment. We begin order processing at about 8:30 a.m. and begin printing the documents at 10 a.m. We print labels and related documents four times daily.

By paying constant attention to small details, we have found time and money can be saved and our operation made more efficient and proficient. The 9% to 10% printer time saving may seem small, but over a year it adds up to a considerable amount. And a mile of paper is conserved as well.

Elliott is DP manager for Associated Grocers of Florida, Inc.

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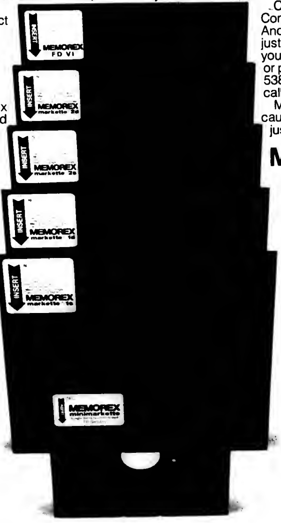

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Toymaker Finds Planning Best Productivity Aid

By Lester E. Stubbs
Special to CW

HAWTHORNE, Calif. — One of the largest expenditures in DP is personnel costs (salary and fringe). At Mattel Toys here, personnel costs account for 60% of the total DP budget. Obviously, as computer equipment prices continue to drop and salaries continue to rise, this percentage will rise even higher.

Every week there seems to be something new to improve productivity. Hardware and software aids are constantly pursued in hopes of increased productivity. At Mattel, we obtained several software packages in the name of productivity.

Unfortunately, at the time we acquired these aids, we were changing our direction too often. As a result, we seemed to be doing the wrong thing — the job not most critical — at certain moments. This often resulted in shifts in personnel assignments, which obviously affected productivity.

There All the Time

As it turned out, one of the best productivity aids available was there all the time — planning,

Recently, we implemented a project management approach at Mattel that emphasized planning. Our last three major projects were very successfully implemented, partly because of this technique. There were far fewer hours lost from changes in direction because these projects were well planned and continually monitored.

We are now vigorously pursuing planning in all areas of DP. We are engaged in both planning our direction three years ahead and planning where we'll be by the end of each week.

Most of the success from these planning efforts has been realized in our weekly planning sessions. Each week, various groups get together to plan the week's activities. Systems and programming management meet each Monday morning to review where they are and where they're going. The Technical Support Group meets weekly for the same purpose.

Meeting Agenda

The first few minutes of each weekly planning meeting is spent on reviewing the current status of all schedules.

If expected progress in a certain area did not occur, we make an attempt to diagnose the situation from the standpoint of avoiding the same problems in the future. As a result of these reviews, we have learned about many previously hidden bottlenecks.

The remainder of each planning meeting is devoted to looking ahead. First, we plan where we should be by next week's planning meeting and how to get there.

We look for potential problem areas and discuss how to avoid them or handle them if they occur.

When various resources are involved, we attempt to ensure that bottlenecks are avoided or minimized. The end result is a work plan for every member of the staff for the current week.

Horizon Extended

After we are reasonably sure of where we should be next week, we extend our horizon and look further into the future. We evaluate our resource requirements and availability. We concentrate on determining in which areas manpower resources will be needed and when they will be required.

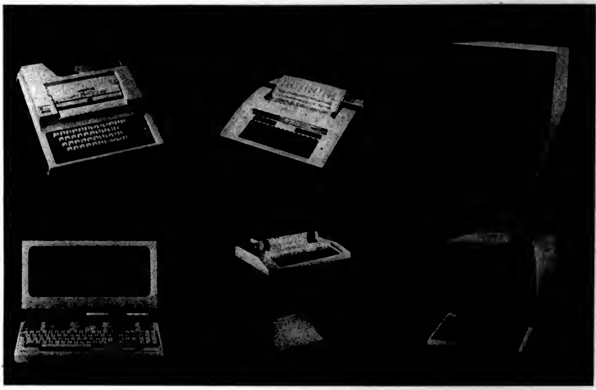
We also review areas where specialized skills are required in the future and what types of education or training are needed and when. With all of these topics being discussed, we are normally able to limit these weekly meetings to one hour.

The results of these weekly planning meetings have been encouraging. Programmers and system analysts are spending less time dealing with changes.

We are coordinating efforts between various groups better and our ability to react to critical situations has been improved.

Don't get me wrong — planning isn't something new at Mattel. We have just expanded our planning efforts and it's paying off.

Stubbs is manager of application systems for Mattel Toys.



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'Mix' Bonds Cheaper

Basic Changes Can Bring Forms Economies

By Edward I. Rudd
Special to CW

There are several ways forms users can save money in the DP department. One is through the use of "groundwood mix" forms bonds.

These bonds employ varying percentages of newspaper-type pulps. The physical characteristics of these papers are sufficient to satisfy the requirements of high-speed printers.

As in all economics, there are tradeoffs; in the case of groundwood forms bonds, the brightness level is lower and the papers will yellow with age. However, they are more than satisfactory for most "stock tab" applications.

These papers were introduced during the paper crunch in 1974. Some of them proved to be unsatisfactory from the standpoint of dust and strength. Since that time, however, the paper industry has been able to produce a paper which is virtually dust-free and bursts and prints well. In some cases, the paper is as bright as normal bonds.

Your daily newspaper is produced utilizing a 60% contrast. A typical forms bond is 75+% brightness.

Once the forms user can overcome the hang-up about brightness, there are other ways to economize.

If the user can become accustomed to the 65% to 75% range, then recycled papers which are not deinked can be utilized. Their off-white and tinted shades provide sufficient contrast and the savings provides the incentive.

From groundwood papers, the savings may be 5% to 15% depending on the mix. Off-whites and tinted recycled papers result in a 25% savings.

Presuming all the user's forms are reviewed annually to assure the proper number of parts are being supplied and used, he might also consider some other factors which are proven money-savers.

These include the size of the form. Does the form have to be this wide? Can you make the form shallower but still usable if you utilize 8 line/in. spacing? Or can you reorganize the data on the form to more efficiently use fewer square inches of paper?

Can a lighter weight paper be substituted and still be serviceable? The difference between 18-pound and 20-pound papers is about 5%, while the difference between 15-pound and 20-pound papers brings a more than 15% savings.

Another production cost cut can result by substituting colored inks for colored papers on multiple-part forms. Changing the ink color part-to-part may be more economical, depending on the print run, than changing rolls of paper.

Savings can be achieved in other areas as well. Packaging, economic ordering quantities, gang runs, timeliness of order and forms management programs should be reviewed with the business forms supplier.

Rudd is technical director for International Business Forms Industries in Arlington, Va.

Do-It-Yourself Not Always Best

(Continued from Page S/3)

doesn't get off the ground on schedule and within budget.

R&D Consideration

Another factor to consider is whether adequate research and development is funded by the service company. If one is going to receive first-class service on a continuing basis, the service company must be devoting adequate attention and resources to state-of-the-art development.

Professional organizations, seminars, publications, trade shows and acquaintances within the industry may provide a good source of opinion about a particular service company. Of course, one can always ask for a list of clients and contact them to obtain information. But keep in mind these may only be the ones who are satisfied.

Another way to select the more reliable and capable service companies is to look for membership in the Association of Data Processing Service Organizations (Adapso).

One should also question the service company representative carefully about his firm's approach to meeting particular needs. Do the personnel really have in-depth knowledge? Are they responsive to users? Is their proposal really believable or do they make empty promises?

Properly used, the DP service companies can be the best allies of a progressive in-house staff. After all, the DP manager's job is to satisfy his "customers" needs in the most efficient and economical way possible. This implies the management of resources and controlling of schedules to get the best results for his company. Resources should be allocated in the most effective way and on the most important jobs.

If you are not considering the use of DP service companies, you may be overlooking an opportunity to save money and improve DP effectiveness in your company.

Jones is vice-president of marketing for Dataflo Systems, a division of Equifax, in Atlanta.

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Plan Helps School Handle Growing DP Load

(Continued from Page S/6)

expenditures run up to $125,000 per year. As production increased, several conservation measures were adopted to reduce paper costs.

First of all, the paper weight was reduced from 20- to 15 lbs. Secondly, paper slewing was restricted to minimize the number of blank pages between jobs and during test program runs.

A third measure condensed job identification and accounting information, reducing the three-header trailer pages to one. This savings alone yields $900/mo at current prices.

Recycling of paper became an established program, with the sale of used paper and the use of the reverse side of large printouts as terminal paper. This not only saves money, but also raises the consciousness of computers vis-a-vis conservation.

Changing from 6- to 8 line/in. on the vertical was considered and rejected because of readability criteria and the many printer plots which would have required reprogramming.

Self-Service Saves

Probably the most difficult area in which to achieve cost cutting was — and is — personnel. Salaries will continue to rise and monies for these increases must come from other cost centers or personnel reductions.

In the computer center's case, staffing reductions occurred as self-service remote job entry facilities were implemented.

Previously, in local batch mode, users presented their job decks over an input/output counter. Clerks gave receipts for input decks and passed out the finished product. This activity required several people to log, file and retrieve I/O.

In self-service mode, users can read their input in at public stations and often get results in a few minutes on a nearby printer. RJE stations are clustered around busy areas to minimize queuing and congestion.

Although other personnel savings were made at UP by eliminating and consolidating activities, the remote concept was principally responsible for major staffing reductions. The computer center went from 74 full-time employees in 1971 to less than 50 in 1973.

The total salary expense in the most recent fiscal year was less than that of fiscal year 1971.

There are many other facets to managing a cost-cutting/cost-avoidance program. Many are peculiar to a given installation and may not apply across the board.

For example, UP recently decided to undertake the maintenance of all its computer equipment. This decision was not entered into lightly. However, if it can be accomplished, the savings are great.

It is not something everyone should do, but equipment owners should continually review and evaluate it as maintenance costs continue to rise.

Evaluating Equipment

In dealing with vendors, we have found it pays to shop around. There are an increasing number of resellers of new as well as used equipment. Although we believe strongly in operating homogeneous equipment, we continually evaluate the cost implications of making a switch.

Some equipment is not affordable, not matter how "cheap." Other equipment has become too cheap not to be afforded.

In the final analysis, those who are looking for an easy cost reduction formula must look elsewhere. There is no substitute for logic and common sense.

Armed with these seemingly scarce commodities, one who is willing to make difficult decisions can make substantial progress in stretching DP dollars.

Ellis is director of the computer center at the University of Pittsburgh.

What to do for a DBMS headache.

A look at data base management systems in our October 30th Special Report.

Getting the right information to the right people at the right time can create tough problems in any large DP system. And the increased bulk of associated information that DP systems handle means a need for more efficiency, capability, and responsiveness.

Data base management systems — the heralded, but controversial solution to increased systems complexity — is the subject of our October 30th *Computerworld* Special Report. Edited by Don Leavitt, *Data Base Management Systems* will be examining many of the uncertainties about DBMS which make it difficult for the planner to determine whether it suits his needs. We'll have stories from users themselves, telling you how they have utilized DBMS, as well as words to the wise on DBMS "overkill". We'll have tips, pointers, and in-depth reviews on evaluating, selecting, applying, and trouble-shooting DBMS, including topics like:

- *The impact of new DBMS on an organization: who "owns'" the data? Who's responsible for its accuracy? Who can use it?*
- *Using DBMS on minicomputers [and even micros].*
- *Relational systems: How they're doing in the real world.*
- *The future of DBMS.*

If you currently use DBMS software, or are planning to buy, this Special Report will be of special interest to you. And if you market DBMS, you'll reach a wide end-user audience here. Ad closing date is October 13th, and your *Computerworld* representative can give you full ad planning assistance. Or, to reserve space for your ad, call Terry Williams at 965-5800..

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Controller Saves On Net Growth

(Continued from Page S/9)

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BAI Gathers Banks' Cost-Cutting Ideas for DP

By M. Arthur Gillis
Special to CW

Many bankers are interested in what it costs to automate a bank's operations. In order to find some answers and spot some trends, the Bank Administration Institute (BAI) of Indianapolis collected cost-cutting experiences from a wide cross section of banks with deposits ranging from $10 million to $4 billion.

The banks surveyed were categorized as follows:

- Those that purchase computer services from service bureaus or correspondent banks.
- Those that are developing their own DP capabilities.
- Those that have been automated for several years and are now fine tuning and optimizing their systems.

The last group produced the greatest number of cost-cutting ideas. The list (presented in no specific order) includes:

1. Install plug-compatible hardware components including a minicomputer for front-end communications; a variety of disk drives manufactured by several vendors; large-scale main memory units; terminals manufactured by a multitude of firms specializing in peripheral equipment; and tape units, printers and card readers manufactured by non CPU vendors.

2. Purchase selected hardware components instead of leasing or renting.

3. Purchase packaged software instead of developing applications in-house.

4. Increase the use of computer output microfilm (COM) in place of printed output.

5. Reduce backup facilities in cases where history shows enough reliability to warrant some risk.

6. Survey users every six months and eliminate reports that are not being used.

7. Use on-line verification only for selected transactions based on experience.

8. Implement terminals and software to provide interactive programming. (Several DP managers indicated increased programmer productivity of 30% to 40%.)

9. Replace labor-intensive activities with equipment.

10. Purchase and use videotape training systems instead of sending staff to classes.

11. Use a laser printer in high-volume installations, because savings are derived from reduction of printed forms.

12. Reduce permanent staff and substitute with part-time personnel. On stabilized systems some users contract for maintenance as projects come up rather than having full-time people.

13. Eliminate punched cards completely. Put all input on-line.

14. Negotiate service bureau costs on a fixed monthly fee basis rather than by unit.

15. Use data management software for management reports instead of writing Cobol programs.

16. Divide service bureau work so that the bank does its own data capture and the service bureau does the posting and updating.

17. Increase front-end planning on system development projects. Include more non-DP people such as the auditor, user and operations manager.

18. Decentralize data capture to the point of origin.

19. Reduce computer reruns and save computer time, paper and special courier runs. (One bank found reruns consumed 45% of production time).

20. Keep track of programmer mistakes that result in bad production runs. (Three errors in a three-month period resulted in dismissal at one bank).

21. Install a system for direct entry to the computer thereby eliminating the magnetic ink character recognition (Micr) capture operation.

22. Improve computer scheduling to eliminate catchup work on weekends and extra shifts.

23. Implement strict standards for all DP activities that are actually practiced.

24. Implement IBM DOS enhancements through proprietary software to produce an OS-like environment.

25. Use the optimize feature of the Cobol compiler.

26. Use utilities for higher speeds and better throughput than mainframe vendor software.

27. Use a fast dump restore package for disk-to-tape off-loading.

28. Concentrate software refinements on long and frequently run applications. Double buffer reads and writes, optimize the blocking factor and eliminate console messages.

29. Use recycled paper for 15% savings.

30. Recycle silver from COM operations.

31. Develop an incentive pay formula for keypunch operators.

32. Use a project control system for all systems development projects.

33. Implement an on-line system to reenter rejected Micr items.

Actual Experiences

The survey identified actual experiences during the past year. Many of the items were mentioned several times, and after the first 15 or so banks, the uniqueness of cost-cutting ideas diminished.

The survey confirmed there is little or no magic in this business, and certainly consultants don't own the license in cost reduction. DP is expensive, but some managers squeeze more

(Continued on Page S/27)

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In-House vs. Outside Source

Before Selecting DP Service, Weigh Priorities

By Dennis A. Fletcher
Special to CW

The steps in selecting computer services are much the same for an in-house computer and an outside processing service such as a service bureau or a time-sharing service.

Until recently, service bureaus supplied the lion's share of DP services to small businesses of about $500,000 in sales. But because of advancing technology, even these businesses can comfortably consider alternatives.

Several Methods

There are several methods used in acquiring any of the three kinds of DP services. First, the organization should go through a formal acquisition process to decide whether it actually needs it own computer and what service provider to use. This can be a little dangerous because since 1975, the small business computer field has been changing at an incredible pace.

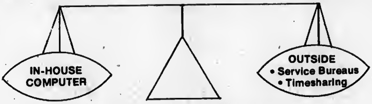
A second way to acquire computer services is to retain a specialist or consultant to evaluate and select appropriate DP services.

The user must be careful to select a reputable consultant. This method is not inexpensive, generally ranging from $1,000 to $10,000 depending on the complexity of the requirements.

But significant time and money can be saved by avoiding pitfalls most people experience in choosing a supplier of computer services. This is what makes a consultant well worth the investment.

The third way to acquire computer services is to select a familiar, "safe" supplier.

There is some advantage in choosing a large, well-known company. But there isn't any guarantee that what it sells will fit the user's particular needs. In the long run, it's safer to use the scientific method.



1. More flexibility over production schedule.
2. More control over system development.
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3. Full-time in-house DP specialists usually not needed.
4. Implementation faster using standard systems.
5. Standard applications software can be seen working.
6. Large-scale computer power offered through time-sharing.

Figure 1. In-House vs. Outside Processing

Weighing Priorities

There are advantages to using an in-house computer, and there are also valid reasons for having processing done outside. The basic reasons for in-house and outside processing are shown in Figure 1.

In selecting either an in-house system or either type of outside service (service bureau or time-sharing), the reputation and stability of the company providing the service are as important as the hardware and programs.

Often, a company about to acquire computer services will include candidates from all three basic types of service suppliers. Thus, in-house computer vendors, service bureaus and time-sharing services all get a fair hearing.

One key element in the selection of a service is the presentation of a proposal by a candidate supplier. The proposal is central to the entire acquisition process. A good proposal will address all the areas important to a company.

Series of Steps

The acquisition process includes a series of steps; each needs to be successfully completed before proceeding to the next.

It is important to define the requirements, and the results should be put into writing and circulated for approval by key users and managers.

This is the most critical step in the entire process. It defines the processing work load. This step is most often underestimated and misjudged — leading to the acquisition of unsuitable services.

Care should be taken to assure all parties are heard. In step two, the firm should put into writing everything a supplier should know about its needs.

A request for proposal (RFP) is given to each supplier under consideration. It contains a detailed description of the processing requirements and some company background.

A statement of the expected time period for the service and a projection of transaction and document volumes and file sizes should be included. Usually the service extends from three to five years.

Volume projections will allow the supplier to gauge the capacity and amount of expansion required in the proposed facilities. It's important that the firm state the RFP in terms of its requirements — and not in terms of the vendor's equipment or resources.

In other words, it is not a matter of how many "50M-byte drives" it needs or how many hours of telecommunications line time needed from a time-sharing service. Needs should be expressed in terms of desired outputs, the number of characters of information in the file and how fast the results should be available.

Candidate Selection

The third step in the acquisition process is critical: deciding who the candidates will be.

An important criterion to remember when selecting candidates is the degree of their local support. If they do not have offices or support centers near the user, their value as a supplier is considerably lessened.

(Continued on Page S/26)

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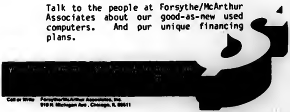

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Small Firms Have Alternatives

Weigh Priorities Before Deciding on Service

(Continued from Page S/24)

The fourth step involves distributing the RFP to the selected candidates and reviewing acquisition plans with them.

Step five begins with the receipt of all proposals by the specified due date. Often this is accompanied by a presentation from each candidate. The proposals should be checked for completeness, since important sections may have been omitted or financial data may not have been provided in the requested format.

Making the Decision

In cases where a decision is difficult, it may be beneficial to use a benchmark test as a tie breaker. The benchmark job should approximate a typical company job, and for some first-time users, it might be wise to have someone with technical DP skills to help in the evaluation.

The final decision should be based on price, comparisons, references, financial status of the vendor and perhaps a benchmark test. No one factor should control the final selection. If there is still no one obvious choice, the user should generally follow its instinct.

In the final analysis, the company it *thinks* will be the best will be the one with whom it works the best.

Once a supplier is selected from the finalist candidates, a contract must be negotiated. If this step fails, another supplier must be selected.

Contract Negotiation

When negotiating a contract, the user should never let a verbal understanding replace a carefully written contract. These contracts can better protect user interests than the providers of computers, software packages or outside services can.

> *The final decision should be based on price, comparisons, references, financial status of the vendor and perhaps a benchmark test. No one factor should control the final selection. If there is still no one obvious choice, the user should generally follow its instinct.*

Second, standard preprinted contracts used by vendors and other service suppliers are written by their lawyers to protect them from customer claims. The user is better off preparing its own contract, using the vendor's as a guide. If a vendor's contract is used, the user's DP and legal counsels should review it.

Third, many vendors adopt a "take it or leave it" approach to their contracts. The user must remember there are always alternative sources, so it shouldn't enter into a contract that doesn't provide equal benefits and protection.

Finally, a key element in negotiating a successful contract is writing down and discussing goals and then determining convincing rationales for the choices.

Wants should be arranged in hierarchical order, to allow for give and take.

The process of acquiring computer services is not easy. It involves a lot of work. But the payoff is selecting the right type of processing services.

Fletcher is director of product development for Info 3, a publishing firm in Woodland Hills, Calif.

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Whether to Build, Buy Software: That Is Question Faced by Users

(Continued from Page S/16)

the prospective user:

1. Make sure the representative is fully aware of the user company's hardware configuration and openly informs the prospective user of any hardware innovations needed to utilize his product adequately.

3. Make sure a list of current users of the product is available.

4. Do not hesitate to ask the vendor for a product demonstration in an environment like the user's own.

5. Review the vendor's pricing agreements.

6. Be sure all interested parties attend the vendor's presentation.

7. Do not hesitate to discuss and compare competitive products with the vendor's representative.

8. Discuss product modifications with the vendor.

9. Upon conclusion of the initial meeting, the vendor representative should leave a reasonable amount of technical information.

Further Actions

After meeting with vendors (the number depends on the results of preliminary investigation, but should be generally limited to the top 10 vendors on the user company's list), there are several important actions to take.

First, the prospective user should contact local users of the product and ask them what they think of it. Installation, maintenance and performance should be of primary consideration when making these inquiries.

If possible, visit a user's installation to see how the product performs in its established environment. In addition to contacting the users on the vendor's list, look for other users as well.

Learn whatever is possible about the vendor's financial situation. In today's world of "here today, gone tomorrow," guard against companies that work on a shoestring; they may leave the prospective user with a product that does not completely meet his needs and may also be unable to fulfill other contractual commitments.

Based on these evaluations and inquiries, the highest scoring product will do the job that needs to be done and at a price that makes sense.

This article was excerpted from "Software — Make or Buy," a Datapro Research Corp. special report.

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Shop Can Save by Writing Its Own Data Base Package

By Norman E. Bollinger
Special to CW

The cost of a data base package for a small shop over a period of several years can easily amount to $10,000 or $20,000. When money is tight, that is a big chunk to write off in a small shop.

But a user can have the real benefits of data base technology for far less than $20,000 by writing his own package — and writing it in Cobol. Here's why and how.

A data base vendor recently explained to me that the cost to develop a data base package is only 10% to 15% of the market cost. The other 85% to 90% is required for marketing and support costs.

If the vendors can produce the code for less than 20% of the market price, so can any user accustomed to defining and writing Cobol subroutine programs.

The average user can likewise define a data base package like a Cobol subroutine program so it looks almost exactly like that of the intended data base vendor. When funds become available, the user can almost directly substitute the vendor's code for his own without changing a program, or he can define and implement almost anything he wants the data base package to do.

Construction of a data base package can be very easy. A user interested in doing so should first familiarize himself with the pacakges that are available. He should attend the various vendor seminars and obtain all of the literature he can, then decide what functions he needs and wants to implement.

Major Components

Basically there are three major components of a data base package that stand out. The first is program-independent data, which is achieved by loading the code and the data definition at run-time instead of embedding it in the Cobol program.

This is easy to do because most vendors provide the necessary software and all the user has to do is use it.

Data independence saves money when it comes time to change programs. Programs that do not use any of the changed data do not have to be touched.

If a user writes his own package, he can have superior data independence because he can pack, compress or convert data.

The second major component of a data base package is the I/O processing to files. This, too, is simple because Cobol has been doing GETs, PUTs ADDs and DELETEs for years.

To make it work, the user will need to define a CALL procedure to the subroutine. If he makes this very similar to his most admired vendor's package, he will be able to convert to the vendor's package very easily if that becomes a reality.

The third data base component is file or record relationships. This is a logical problem which, if well defined, will be easy to handle.

The key to the user's success will be good design, and the user can learn a lot about good design from the vendor's packages. With a good design, his package can be superior to the vendor's because he can implement the things he needs instead of just what the vendor supplies.

Most users can definitely have the basic payoff features of a data base package at a real cost savings. But the best part of that is the user controls it and can code whatever he needs.

Bollinger is a systems programmer for the Baltimore, Md., County Public Schools. Users can write to Bollinger at 3223 Suffolk Lane, Fallston, Md. 21047 for a data base package guide for $35.

Bankers Outline Cost Cuts

(Continued from Page S/23)

results for their dollar than others.

Here are cost categories included in the total cost of DP as developed by one bank which is also in the business of selling DP services:

- Keypunch and data entry.
- Balancing clerks.
- Central processor.
- Peripheral equipment.
- User department coordinators.
- Subcontract work.
- Courier service.
- Commissions to salesmen.
- Forms.
- Internal messenger.
- Special equipment or service.
- Systems and programming personnel.
- Operations and administration.
- Corporate administration.
- Marketing administration.
- COM.
- Special sales expense — advertising for payroll service.

All indirect expenses such as rent are factored into each cost category.

Besides knowing what it costs to produce its services, the bank uses cost data to point out correctable deficiencies. For example, abnormal computer costs were caused by excessive reruns resulting from careless operator handling; excessive clerical costs resulted from inaccurate or poorly inscribed data submitted by the user, and high demands from on-line operations caused excessive paging of batch processing runs resulting in greater CPU costs for certain jobs.

On a less frequent basis, management compares operating costs with industry standards. There are enough statistics available now to make reasonable comparisons of DP costs for maintaining a DDA account, handling an automatic teller machine transaction, preparing interest checks, making name and address changes to an account and other bank DP activities.

Considering the attention that cost reduction is getting in DP organizations, it appears there will be increased attempts to trim budgets. Keep in mind the tradeoffs. It's not as simple as just purchasing your hardware, getting rid of some systems and arbitrarily cutting your staff. And besides, how much silver is in processed film?

Gills is a management consultant for the Bank Administration Institute in Chevy Chase, Md.

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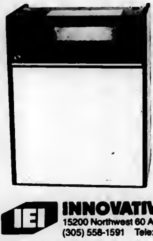

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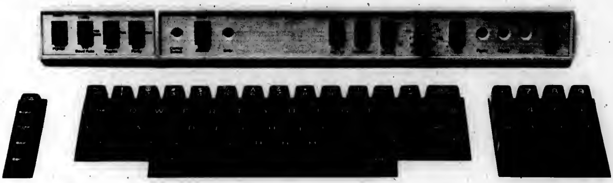

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Fear of Minis Robs Users of DP Assets

By Harmon Houghton
Speciai to CW

Many new and established businesses participate only marginally in the benefits of computer technology, not because of obsolete equipment, but because of an outmoded management philosophy.

These "Third World" companies are characterized by a maze of manual procedures, accounting machines and outdated forms. They are also typically inhabited by 18 to 20 employees struggling to keep up with today's competitive problems by utilizing the technology of two or three decades ago.

It is easy to dismiss outdated user philosophies when speaking in the abstract, but management consultants who work with "Third World" companies soon discover the obstacle to progress is not innate business conservatism. Instead, the stumbling block is a genuine belief that minicomputers would not only wipe out proven and established procedures but that management itself would lose control of its ability to run things and make decisions based on understood information.

Obviously, a wide communications gap separates minicomputer manufacturers from a large population of potential users.

Another problem encountered by management consultants who attempt to bring the benefits of automation to their clients is the belief that minicomputers can be all things to all people.

If there is one attribute that owners and managers of medium-sized companies share, it is a belief that "we are special." If they are going to invest in a system that will substantially change their operations, they want to be assured it is "just right for us."

Not enough is being done by minicomputer manufacturers and distributors to address this concern. Often their literature, while technically detailed, is philosophically vague.

The medium-sized business audience could probably do with less technical detail and more market-directed literature prepared for special categories of users. An understanding of the needs and problems of these users is essential.

Reasons for Resistance

Several factors contribute to the resistance of these potential small systems users. One factor is the extent to which a

(Continued on Page 64)

At $1,000 to $4,000 Less Cost

Small Systems Line Emulates DEC Units

By Jeffry Beeler
CW Staff

BALTIMORE — Though both hardware- and software-compatible with the Digital Equipment Corp. PDP-11 line, a family of small business systems from Financial Computer Corp. reportedly provides 300K- to 2.8M bytes more mass storage than the equivalent DEC configurations for $1,000 to $4,000 less.

The Financial Computer systems, which together form the Data Systems XI line, are also compatible with each other and with all members of the firm's System III small business computer series, introduced in 1975, according to a company spokesman.

Capable of running DEC's RT-11 and RSX-11 operating systems as well as Financial Computer's OS-11 software, the Data System XI consists of three upward-expandable versions — the models 1, 2 and 4.

All three versions incorporate the same CPU model — a 16-bit PDP-11/03 — and they differ primarily in mass storage capacity. Model 1, equivalent to the PDP-11/03 DEC Datasystem 322, typically provides a 1.3M-byte floppy diskette subsystem, while Model 4 compares to the Datasystem 324 and supports a 10M-byte dual cartridge disk unit, the spokesman said.

Model 2, meanwhile, incorporates a 3.75M-byte floppy diskette subsystem and belongs to a product class somewhere between the Datasystem 322 and 324, he added.

A standard 322, by contrast, accommodates 1M byte of dual floppy diskette storage, 300K bytes less than Model 1, and costs in excess of $1,000 more than its Financial Computer counterpart. The 324 incorporates a 7.2M-byte cartridge disk unit, 2.8M bytes less than the Model 4, and costs about $4,000 more than its replacement, the source explained.

Thus, the middle-of-the-line Model 2 provides nearly four times more diskette storage than the 322 while costing $5,000 less than the 324.

Except for the Data System XI's greater mass storage capacities, no significant differences in hardware capacities or processing power reportedly separate the Financial Computer systems from the DEC equipment they emulate.

Rather, the Data System XI's main competitive edge over its 322 and 324 rivals is its superior software, the official claimed. Financial Computer's OS-11 op-

(Continued on Page 68)

Distributed Systems Said to Pose Growing Problems to DP Managers

By William Tekien
Speciai to CW

Every time a manager picks up a business periodical, he is deluged with the prominent buzzword of our industry — distributed data processing (DDP). But ask 10 people — DP professionals or not — what the term means, and you are likely to get 10 different answers.

What follows is an attempt not only to clarify the meaning of DDP, but also to suggest a common sense approach toward realizing many of the benefits the concept promises.

DDP is a technique whereby two or more computers are used to carry out the DP activities of an organization in a complementary fashion. The key word in the above definition is "complementary." Without a complementary arrangement, DDP does not exist.

Uncomplementary systems are decentralized. Decentralization of DP wasn't the answer in the early '60s and it will not work any better today.

To many people, distributed processing is synonymous with minicomputers, but this is a misconception. An effective DDP arrangement can exist with large mainframes, minicomputers or a combination of both.

Seven Major Issues

DDP, while providing better solutions to information problems than ever before, has made the DP manager's job more difficult than ever before. Instead of having to deal only with the problems of a one-vendor shop, a DP manager faces seven major issues with DDP that make his job more challenging: people, data communications, multiple vendors, training, software, financial arrangements and service and

(Continued on Page 70)

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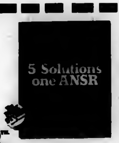

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Turnkey Package Replaces DEC CTS-300 Software

IRVINE, Calif. — Users of the Digital Equipment Corp. D320 series systems can replace their CTS-300 software with a turnkey package that reportedly sorts files 20 times faster and provides 60% smaller SAV files than its DEC counterpart.

Plessey Peripheral Systems, Inc.'s PCS-001 runs existing programs in RT-11 languages like Dibol, Basic, Fortran and Macro-11 while allowing as many as four users to perform production or development tasks concurrently with the company's LSI-11-based Micro-1.

Consisting of a Dibol-compatible compiler and a time-sharing monitor that runs under RT-11, the software package spools peripherals and allows terminals to perform multijob virtual line operations.

Peripherals offered with the product include floppy disk units, 5M- and 10M-byte disk cartridges system, 64M-byte disk pack unit, tape systems, the VT52 and VT100 terminals plus 45 char./sec, 150 line/min and 300 line/min printers.

With an unsupported PCS-001 license, a DSYST-1 commercial hardware system incorporating a 64K-byte main memory, 10M-byte disk cartridge and CRT terminal costs $15,690 from the company at 17466 Daimler Ave., Irvine, Calif. 92714.

Users Robbed of DP Assets

(Continued from Page 63)

company must interrupt its operational flow to accommodate a new technology. This concern is a common excuse for postponing change.

Another factor is the extent to which "proven procedures" will have to be abandoned and untried ones introduced.

A third reason for the resistance to change is personnel. There is a far larger residue of veteran office employees in medium-sized companies than in large corporations. Management is reluctant to discharge these employees. It realizes their knowledge of products and customers and their ability to "read" management's mind in many everyday decisions constitutes a valuable business asset. Must they be replaced with specialized "computer people" who speak their own professional jargon, incomprehensible to company management?

Obviously these questions are not important to a corporation with its battery of sophisticated computer managers and programmers, but they are important to minicomputer users.

And what about downtime? Does a company just cease business when its minicomputer goes down and the nearest service office is hundreds of miles away? Can users fall back on their traditional procedures? Just what do they do?

Many company owners spend troubled nights because of these fears, and it is up to the minicomputer industry to address them openly and helpfully.

The minicomputer industry would not be thriving and growing if it were not doing a good job. But there is probably not a management consultant who has not had to work overtime attempting to overcome the disillusionment of a client who wants to "throw the damn thing out" and revert to his old systems.

If vendors did a better job educating their users as well as selling hardware, the rate of satisfied minicomputer customers would escalate sharply.

Philosophical Gap

A wide philosophical gap separates vendors from their users. The two sides represent different backgrounds, each with its own technical language. Vendors and users interface in a semitechnical area where the potential for misunderstanding is considerable.

Often users will lose years of hardware benefits because they are using their minicomputers minimally.

Many users are either afraid or do not know how to tap the full capabilities of their business systems. They need guidance, assurance and help — the kind manufacturers and distributors can and should provide.

"Return on investment" is another area of complaint related to the problem of underutilization. Of course, users who take advantage of only part of their minicomputers' capabilities will realize only a percentage of their anticipated return on investment and, as a result, be disillusioned.

Minicomputers are tools mainly designed to serve small and medium-sized businesses. The industry has a vast stake in the goodwill and satisfaction of this business community.

Houghton is president of Houghton Management, Inc., a New York City consulting firm.

VAX-11/780 Gets Printer Interface

ORANGE, Calif. — Users of Digital Equipment Corp.'s VAX-11/780 can reportedly attach their computers to most line printer models with an interface from MDB Systems, Inc.

The line printer controller interfaces printer models from Centronics Data Computer Corp., Data Printer Corp., Dataproducts Corp., Data 100 Corp. and General Electric Co. as well as products emulating those printers, according to an MDB spokesman.

Depending on the interface specified, the controller costs $650 to $1,250 and is available in 14 days from MDB at 1995 N. Batavia St., Orange, Calif. 92665.

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Service Helps First-Timers Make System Selections

NEW YORK — Prospective users can reportedly receive help in choosing the most appropriate minicomputer product or service for their applications by subscribing to a standardized service offered by the Brandon Consulting Group, Inc. (BCG).

Available at a fixed price, the Turnkey Systems Evaluation (TSE) service is said to help first-time business users avoid many of the pitfalls of evaluating and selecting turnkey systems, minicomputers and software packages as well as time-sharing products and services.

Typical subscribers to the service will include organizations whose annual revenues range from $1 million to $20 million, a BCG spokesman said.

BCG's service consists of a report that identifies and evaluates available DP alternatives for small system users and recommends the most suitable option for each client, the source added. Some of the report's elements are:

- An application analysis defining each client's business needs and objectives and identifying potential areas of improvement.
- A discussion of the benefits, limitations and costs of the various small systems approaches as well as a listing of configurations and vendors available for each option.
- A detailed installation plan and schedule.

To prepare such a report, a BCG consultant visits each client's installation to review the current and contemplated business applications and its DP methods. The consulting firm's staff then discusses the client's needs with the appropriate hardware vendors, identifies relevant software packages and gathers other external information.

After preparing and submitting a final TSE report, the consultant arranges a follow-up meeting with the client to explain the document's findings and recommendations.

Depending on the size and nature of a user's business, the TSE service costs $1,000 to $4,000, excluding consultant expenses. BCG is located at 505 Park Ave., New York, N.Y. 10022.

Syfa Can Now Mix Disks

IRVINE, Calif. — Any combination of eight 80M-byte and 300M-byte disk units can reportedly be configured with the Computer Automation, Inc. Syfa system following the firm's introduction of a "mixed drive" design feature for the network communications and distributed processing system.

Previously, Syfa systems could accommodate either 80M-byte or 300M-byte disk units, but not both models simultaneously, a CA spokesman explained.

Implemented through a modified version of the Syfa Concurrent Logic Operating System the disk system design feature permits Syfa configurations to accept CA's DSK-80 and DSK-300 disk units, which accommodate 56M bytes and 220M bytes of formatted storage, respectively. As a result, the Syfa system's mass storage capacity now ranges from 56M bytes to 1.76G bytes, the spokesman said.

The design feature allows Syfa system users to add 300M-byte disk units for large storage requirements and at the same time retain 80M-byte units for less demanding applications, CA noted.

Both the DSK-80 and DSK-300 are compatible in format and hardware with all existing Syfa systems.

With the design feature, a DSK-80 and DSK-300 costs $17,500 and $32,500 respectively, from CA at 18651 Von Karman, Irvine, Calif. 92713.

Diskettes Fit IBM Systems

SANTA CLARA, Calif. — Dysan Corp. has introduced a line of 8-in. diskettes that are said to be compatible with the IBM System/32, System/34, Series/1 and 5110 systems.

The formatted Dysan Model 3740 recording media are available in three versions: one-sided single density (equivalent to the IBM Diskette 1): two-sided single density (equivalent to the IBM Diskette 2); and two-sided double density (equivalent to the IBM Diskette 2D).

In quantities of 10, the Diskette 1-emulating 3740/1 costs $7; the Diskette 2-emulating 3740/2 costs $8; and the Diskette 2D-emulating 3740/2D is priced at $9.

Dysan is at 2388 Walsh Ave., Santa Clara, Calif. 95050.

Trays Built to Hold 50 or 110 Diskettes

COMMACK, N.Y. — Two storage tray models from the Data Products Division of Robins Industries Corp. reportedly ease access to and refiling of diskettes.

Both versions, which hold 110 and 50 recording media, respectively, provide index dividers, vinyl dust covers and titled, adjustable plates that hold diskettes at an angle to simplify retrieval.

The Model 78-058, which holds 50 diskettes, costs $33; the Model 78-059, the 110-diskette version, is priced at $48.

Robins Industries' Data Products Division is located at 75 Austin Blvd., Commack, N.Y. 11725.

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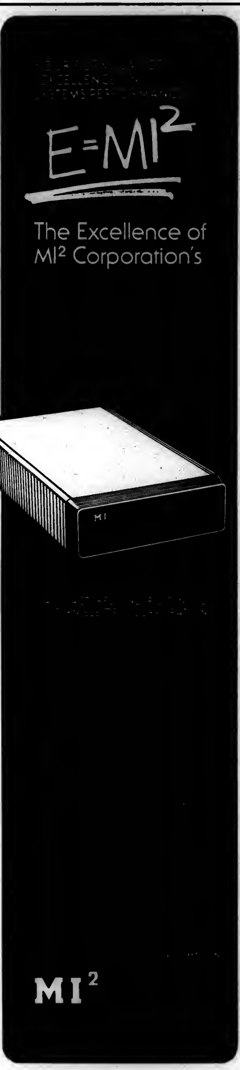
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HP Graphics Plotter Attaches To Systems With IEEE 488 Bus

PALO ALTO, Calif. — A graphics plotter that reportedly costs half as much as its competitors operates with any Hewlett-Packard Co. system equipped with an IEEE 488-1975 interface bus, according to a spokesman for HP, which makes the plotter.

Given only an end point coordinate pair, the 7225A operates in addressable microsteps of .032 mm to produce continuous lines of any length or angle, the source said. The unit plots at 250 mm/sec and generates text at up to 3 char./sec on paper as large as 8-1/2 in. by 11 in.

In addition, a series of "personality modules" allows users to vary the plotter's interface, programming languages and capabilities.

The Model 17601A personality module, for example, adapts the 7225A to the IEEE 488-1975 interface bus, while another member of the 17600A personality module series allows the plotter to accommodate an 8-bit parallel interface.

HP 7225A Plotter

With the 17601A module, a high-level instruction set called the HP Graphics Language provides 38 instructions for vector plotting, character set and line type selection, point digitizing, user-unit scaling and labeling with user-selectable character size, slant and direction. Software compatible with the HP 9872 graphics plotter, the module also permits the 7225A to operate in a "listen only" mode.

The plotter and 17601A cost $1,850 and $750, respectively, from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Small Business Systems Emulate DEC's Datasystem 322 and 324

(Continued from Page 63)

erating system supports up to four concurrent foreground and background tasks in a real-time, multiprocessing environment, whereas DEC's RT-11 typically accommodates fewer simultaneous users, he said.

Financial Computer's software also uses a compiler Basic, which provides more than twice the speed of a common interpretive Basic.

Moreover, the Data System XI family comes with a library of application packages that have already been tested and debugged in three years of operation with the System III series, the official added. Some of these packages include an integrated system for order processing, invoicing, accounts receivable, inventory control, purchasing and accounts payable; an integrated motor freight system; and an integrated insurance agency system.

The application software library also includes packages for payroll and job or product cost reporting, sales analysis and commission statements, general ledger and financial reporting with a data base management capability, medical insurance claims and billing, professional time recordkeeping for professionals, statistical sampling for auditors and word processing.

Each Data System XI model's processor provides an 833K-word/sec direct memory access channel, hardware floating point multiply and divide feature and an RS-232 and 20 mA serial I/O port that reportedly transfers 19.2k bit/-sec synchronously.

12 Chassis Slots

All three models also provide 12 CPU chassis slots. When a processor board occupies one slot, an I/O board two and a memory board another, a Data System XI computer will typically support 61K bytes of MOS memory, a 1,920-char. CRT terminal and a printer.

Model 1 supports a 60 char./sec printer; Model 2, a 120 char./sec bidirectional printer; and Model 4, a 18 char./sec bidirectional printer.

Standard Model 1, 2 and 4 configurations cost $18,000, $25,000 and $30,000, respectively. Deliveries start in November from Financial Computer at 412 W. Redwood St., Baltimore, Md. 21201.

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User Links Minis and Mainframe, Gets Net

By Marguerite Zientara
CW Staff

DETROIT — Expandability, "excellent" file management and extensive personnel savings top the list of benefits a large insurance company realized when it interfaced a network of small business computers with its large mainframe to form an intercorporate time-sharing network for data transmission and processing, according to a spokesman for the firm.

Michigan Mutual Insurance Co., a supplier of multiple line casualty and property insurance, attributed its improved policy issuance and claims adjustment services to Datapoint Corp.'s Datashare business time-sharing system.

The company uses this system to generate managment information each day, according to Karl Dowd, the firm's vice-president of DP.

For a company which processes about 700,000 premium transactions and 130,000 claims annually, the efficiency of primary applications such as claims adjustment and policy issuance is important. At Michigan Mutual, that efficiency is enhanced by features such as text-editing workstations which enable clerks to correct errors during data entry, Dowd said.

Reduction in Staff

In addition, the placement of Datapoint units in the field has reduced the need for keypunch units and operators in the home office, and thus yielded a "considerable" savings for the insurance company, he added.

"We've been able to reduce clerical requirements by about 30 positions in keypunching, sorting and other areas," Dowd noted. "We have also eliminated mail service problems and lowered our incidence of input error for a major contribution in management savings."

Besides providing on-site processing power, the Datapoint systems have enabled Michigan Mutual to off-load work from its IBM 360/65 mainframe and locally perform claims adjustment and policy issuance activities without having to contact the home office. This capability has resulted in lower communications costs, Dowd said.

Before installing the current systems, the company had been operating with a network based on the IBM 360/65 and several buffered batch terminals.

Those units, however, lacked the "intelligence" to perform local processing chores, Dowd said. As a result, the mainframe and its batch printer were overloaded with applications and storage functions.

Moreover, a serious communications gap developed between the home office and its extensive regional and branch offices, Dowd recalled.

Expandability Criterion

When Michigan Mutual decided to expand its computer network, the firm began looking for a system that could perform various distributed DP and communications tasks as well as accommodate the company's future growth needs.

Past growth rates had indicated the need for a system that could readily adapt to the firm's expansion requirements. The Datashare system offered a modular expandability that ensured future growth without costly upgrades, Dowd said.

The Michigan Mutual distributed processing network currently utilizes the home office IBM 360/65 and six Datashare systems, five of which are located in regional cities and one at the home office here.

These systems incorporate Datapoint 5500 business processors, each of which supports up to 16 Datapoint 3600 CRT workstations. Situated in the company's field offices, the workstations connect to the home office 5500 through telephone lines.

In each office where a workstation operates, a terminal printer is also available for on-site output.

"The on-site terminal printers give us the speed and flexibility to immediately print claims reports and new policies without having to rely on a centralized batch printer," Dowd noted.

Each of the 5500 processors utilizes dual 20M-character disk drive units that store 75% of the remote sites' master files. A master file backup is maintained by the 360 system, which receives information from the Datapoint systems in the field.

'Independent' Units

While most network modules are located in Michigan Mutual's own offices, some units are installed in the offices of independent agents. The Datapoint systems are priced low enough to make computer installations in remote locations economically feasible, and they allow convenient access to important files both to our company agents and independent agents," Dowd noted.

The systems generate and store information about policy issuance and claims adjustment during the day and are polled at night by the central Datashare installation. This data is then transferred to the IBM system, which produces a current report about claims adjustment and policy issuance by the start of the next work day.

Previously, Michigan Mutual needed several days or weeks to secure information that is now generated daily throughout the network.

During the day, the 5500 processor here receives on-line transmissions from workstations in the firm's greater Detroit offices.

After normal working hours, the Datapoint 5500 here automatically polls the 5500s in the other offices.

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Micros Gain Floppy System

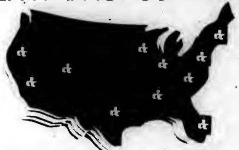
TORRANCE, Calif. — The V500 Series floppy disk system from Vista Computer Co. is compatible with all Zilog, Inc. Z80 and Intel Corp 8080-based microcomputers, according to a Vista Computer source.

Using a standard Digital Research CP/M operating system, the 512K-byte unit reportedly provides file management including random access and context editing of programs and text.

Each system incorporates two floppy disk drives assembled in a case with power supply, fan and power switch, an S-100 bus controller card that plugs into the computer and controls up to four drives and an I/O cable that connects the controller and drives.

The V500 costs $2,500 from Vista Computer, Dept. P1 at 2807 Oregon Court, Torrance, Calif. 90503.

OEM America Meets



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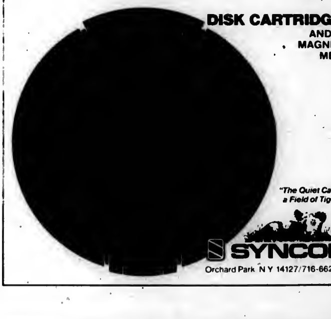

"The Quiet Cat in a Field of Tigers"

SYNCOM

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Micro Comes Packaged With Winchester Disks

AURORA, Calif. — A packaged, Winchester disk-based microcomputer system from Ohio Scientific, Inc. reportedly eliminates terminal interrupts and prevents degradation of CPU speed.

Ohio Scientific credited those benefits to the C3-B's architecture, in which the disk unit communicates with the CPU through a memory channel that in turn services a dual-port memory.

Mounted in a 42-in. rack, a minimum C3-B configuration incorporates a 48K-byte static random-access memory, a 74M-byte Winchester fixed-disk unit, dual floppy disks for program and data mobility and a CPU board with three microprocessors — an MOS Technology, Inc. 6502A, Motorola 6800 and a Zilog, Inc. Z80.

The printed circuit boards necessary for this configuration, however, occupy only seven of the C3-B processor's chassis slots. Thus, with the remaining nine slots, users can expand the system to incorporate up to 768K bytes of central memory, three additional Winchester disk units for a total of 300M bytes of mass storage and 16 communications ports.

Software available with the C3-B includes the OS-65U disk operating system and Extended Basic. The OS-65U provides virtual data files and supports file structures like the multikey index sequential access method.

The system also provides a library of distributed processing, time-sharing, and multi-terminal applications software.

The C3-B costs $11,090. OEM discounts are available, the firm noted from 1333 S. Chillicothe Road, Aurora, Ohio 44202.

Distributed Systems Posing Problems for DP Managers

(Continued from Page 63)

support.

- *People*: DDP can frequently mean a lack of depth in the technical support of a distributed application. When an individual gains expertise in supporting a remote system, that person frequently gets locked into that job.
- *Data Communications*: Lack of a single industry standard or consensus on the future direction of data communications adds to the complexity of DDP.
- *Multiple Vendors*: Although a company's application can be handled by any one of several vendors, it is difficult to keep up with introductions, model numbers and different names for similar functions.
- *Training*: Training usually requires traveling to a vendor's site. There is little videotape training available for the products of all but the very large vendors. Because of the cost, training is usually done sparingly — a fact that contributes to the lack of support depth.
- *Software*: Again, each vendor has a different name for fairly standard software functions. Software all too often fails to live up to claims made in marketing literature.
- *Financing Arrangements*: Only a few companies lease their hardware. Thus, users usually must commit themselves to a purchase, and this often prevents a customer from taking advantage of technological enhancements.
- *Service and Support*: Although a vendor may have a good overall track record on service and support, support quality tends to vary by geographic location. Vendor size is not always a good indication of the level of service to be expected.

Political Conflicts

While the above list outlines the challenges facing the DP manager under optimal conditions, DDP often brings with it political problems in a user organization. Many DP managers are finding that decentralized processing under the guise of DDP is eroding their ability to control their companies' information systems and the data resources.

Vendor salesmen frequently sidestep the main DP group and sell their wares directly to user departments. In many cases, users have a myopic view of their information systems needs, tend to care little about the requirements of other departments and in general have little or no training in sound DP concepts.

For a company to realize the maximum benefits of DDP, it should consider the following steps when formulating DDP policies:

- Stick to a few vendors with a proven track record. This tactic will help minimize the problem of inadequate staff support depth. Monitor the industry and review the list periodically.
- Maintain a single thread of organizational responsibility for an information system function by giving a DP manager authority and responsibility over remote DP staffs.
- Build company data bases according to a well-defined plan. The role of data base administrator is more critical under DDP. Failure to recognize this fact can cause user confusion and misunderstanding and have an unfavorable impact on an organization's decision-making and managerial effectiveness.
- While not always feasible, developing application software with a central host computer and allowing a distributed computer to access only executable programs can reduce the level of staff support required at the remote site. This approach will make unauthorized tampering of remote software more difficult.

DDP is here to stay. As long as hardware prices decline as fast as performance improves, its impact will be felt by every medium- and large organization. The company which uses a straightforward, common sense approach in managing DDP will have a clear-cut advantage over its competitor that doesn't.

Tekien is director of management information services for the Armour-Dial Co., Phoenix, Ariz.

Monitored by Two Minis

Ford Personnel, Parts Come and Go Smoothly

PLYMOUTH, Mich — When a user found it could not economically upgrade one of its mainframes to monitor personnel and material traffic, the company scrapped the large machine and assigned the task to two minicomputers.

Installed at Ford Motor Co.'s Sheldon Road Plant here, the minis reportedly keep track of the firm's 1,250 hourly personnel and about 250 daily parts deliveries for less money than the manufacturer would have had to spend to expand its mainframe.

In addition to tracking the flow of parts and labor in and out of Ford's manufacturing facility here, the minis provide the data from which the company's Honeywell, Inc. 115 produces long-term payroll and inventory records.

Strategically Located CRT

With 20 annual inventory turns, the Ford facility, which manufacturers auto heating and air-conditioning units, requires an effective real-time material control system to avoid misplaced parts and production shutdowns.

To this end, the company has placed a CRT terminal near the receiving dock to allow the material-control mini, a Hewlett-Packard Co. 3000, to monitor the arrival and dispersal of all parts.

With the CRT, each incoming parts shipment — one or more than 80 rail- and truckloads per day — is validated against the plant's master parts record. Comparing part number, vendor and other data for accuracy, the HP 3000 notes any discrepancies for immediate correction and issues a purchased parts receipt tag for attachment to the shipment.

About 80% of the shipments received by the facility go to any of approximately 10,000 warehouses for storage. The mini selects these sites on the basis of container size and type, physical warehouse barriers such as columns and other considerations.

The remaining 20% of the parts go to either quality control for inspection and counting or directly to a production line. The HP 3000 systematically picks the correct sampling for quality assurance.

At the same time, the system updates warehouse inventory records so subsequent dispersal of stored items conforms to a first-in, first-out rule.

Keeping four hours ahead of production, two line feeders manually check the production lines for upcoming shortages. They then inform the control room operator of the supply quantities and part numbers required to maintain a smooth production schedule.

The operator enters the data into the CRT station, which immediately issues a pick list specifying each part by its warehouse location and production line destination. The plant's forklift drivers rely on this list to retrieve stored parts and deliver them to the appropriate production line sites.

Equipped with a 50M-byte disk unit, the 256K-byte system has virtually eliminated production line delays caused by misplaced parts or material shortages, according to data system supervisor Phil Badour. Periodic warehouse audits estimate the accuracy of the system's on-hand inventory records at 98% to 99%, with human error accounting for most oversights.

As each part is received or dispersed to production, the system automatically generates exception reports to signal impending parts shortages.

'Min/Max' Report

In addition, the system generates a "min/max" report that lists the types of parts whose inventory levels exceed or fall below a preset limit. Issued once each day or on demand, these reports alert Ford's parts control department to potential shortages or excesses.

Under the company's previous inventory control system, only DP personnel could access these ad hoc exception reports. "You don't have to be a programmer to use the system, so we've increased our inquiry capability," noted Badour.

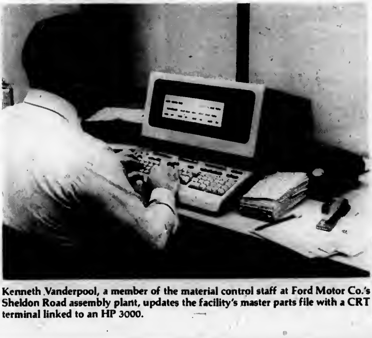
The system also lists all parts in the facility's master part file by accepted quantity, warehouse location, quality control area, rejected quantity and total inventory dollars.

Working with Ford's parts-control mini, an HP 1000 helps monitor the arrival and departure times of the manufacturing site's hourly employees.

Linked to 20 badge reader terminals situated at the building's entrances and exits, the HP 1000 captures payroll source data as the employees use their plastic identification cards to check in and out of the facility. It then transfers this data to the HP 3000 for storage.

Three buffers that together hold 1o5 clock-ins store the information until the HP 3000 is ready to receive the HP 1000's transmission.

At the end of each day, the central mainframe generates a daily exception report that compares the time and attendance data stored in the HP system with that recorded on the foremen's timesheet.



Kenneth Vanderpool, a member of the material control staff at Ford Motor Co.'s Sheldon Road assembly plant, updates the facility's master parts file with a CRT terminal linked to an HP 3000.

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To Handle 40% Sales Growth

Window Blind Maker Changes Minis In a Day

HOBOKEN, N.J. — Four straight years of 40% or more annual sales growth had outstripped the capacity of a manufacturer's minicomputer system until the firm expanded its DP capabilities by upgrading its installation in one day.

"We installed [our NCR Corp. Criterion 8550] on a Friday evening, and by Saturday morning it was running without a change in any operating program," recalled Andrew Perrius, DP manager of Levolor Lorentzen, Inc., a maker of custom aluminum window blinds.

"Considering our growth," he noted, "we needed to upgrade without going through a conversion."

Linked to a 96K-byte disk storage unit and a 2,000 line/-min printer, the 128K-byte CPU replaced an NCR Century 101, which Levolor Lorentzen installed four years ago. At that time, the company's current business boom began.

Before the window blind maker acquired the Century 101 in 1973, the company operated an NCR Century 100. But the firm's daily workload of more than 2,000 orders and 2,000 invoices eventually exceeded the original system's DP capabilities.

Shortcuts Allowed

With its most recent hardware change, the firm has gained a processor with six times greater internal speed and 45% more throughput than its preceding system, Perrius said.

In 28 minutes, the current equipment can run programs that previously took twice as long. It can also expand to meet the company's DP requirements for the next five years, even at current growth rates.

Moreover, the system has cut Levolor Lorentzen's billing turnaround from 15 days to about four days after shipment of an order, Perrius explained. Company officials expect eventually to trim invoicing leadtimes to one day or even to achieve same day billing, he said.

Among its other benefits, the system has halved production times for the firm's quarterly and year-end reports.

Expansion Planned

As the hub of Levolor Lorentzen's long-distance order entry communications network, the system performs billing and controls inventory for the firm's nine nationwide offices, which connect to corporate headquarters through remote CRT terminals.

Company officials eventually plan to install 13 of these NCR 7200 CRT terminals at their branch locations. Through the terminals, the firm will transmit orders on a dial-up basis to either an NCR 260 data terminal or another 7200 in the corporate computer center here.

Although the system provides on-line capabilities, these order transmissions will take place off-line to permit inquiries about items like accounts receivables, credit limits and order status.

When the planned system becomes fully operational, Levolor Lorentzen's home office will receive orders from the nine remote locations in no more time than is needed to transmit them electronically across the country. Previously, the company had to wait as long as five or six days for orders mailed from its Oakland, Calif., office.

In addition, the system will control stock levels and thereby streamline production. "We will be able to see what's moving and what's not moving," Perrius said.

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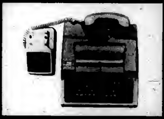

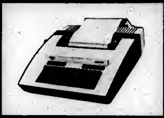

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Benwill Show Survives

Cancellation Ends Chicago Show Conflict

By Ann Dooley
CW Staff

CHICAGO — The Windy City has been at the center of a storm between sponsors of two competing personal computing shows that caused one — the Bunnell-Edlin-Cragg Mid-America Personal Computer Show — to cancel its show entirely.

The problem began last year after the Midwest Personal Computing Show, when several of that show's sponsors split with their co-sponsor, Benwill Publishing, Inc. Both groups felt they had claim to the show held here, and this year Benwill scheduled its Midwest Personal Computing Show for one week before the Bunnell-Edlin-Cragg Mid-America Show, slated for the middle of next month.

"The whole thing was a mix-up. The industry was confused because it didn t know which show to participate in. Without industry support, the hobbyists didn't know which show to attend. It would have been a waste of money for vendors to exhibit in both places, and no one knew what to do," according to Austin Cragg, Mid-America's show manager.

The result was insufficient response by the industry to justify going ahead with the Mid-America Show. "The waters had become so muddied that we just withdrew."

According to George Palken, Benwill Publishing president, the date for the Benwill show had been scheduled all along and was not meant to conflict with anyone else's. The Mid-America sponsors "had been with us last year and split away expecting to do better, and it just didn't work out that way," he said. "We survived and they didn't."

There is no reason why the Benwill show shouldn't be a good one, he added. Currently, 120 exhibitor booths have been committed and more orders are still coming in.

Predicted attendee estimates range between 12,000 and 15,000, he added.

'Shows Don't Deliver'

David Bunnell, past editor of *Personal Computing Magazine* and co-sponsor of the Mid-America Show, compared the whole conflict to "a Mexican standoff."

Most of the exhibitors and attendees seem to be planning to attend the Dallas personal computer show at the end of September and skipping Chicago, according to Bunnell. "I hope the Dallas show is better than some of the others have been. Most of these shows are stupid — they don't deliver what they promise to the hobbyists," he said.

The disillusioned Bunnell said he is finished with sponsoring computer shows and has turned to writing. Unlike his co-sponsor Cragg, who is thinking of rescheduling the personal computing show in Chicago next spring, Bunnell plans to participate in future computer shows only as a seminar speaker.

Bunnell noted that overtures were made to the Benwill group to combine the shows. "We didn't get anywhere with Benwill, but if it wants to spend a lot of money on this show, that's up to them, but we're through with it," Bunnell stated.

The surviving show, the Midwest Personal Computing Show, is scheduled for Oct. 5-7. Further information is available from Phillip Ullo, Industrial and Scientific Management, Inc., 222 W. Adams St., Chicago, Ill. 60606.

Intelligent Micro-Based Terminal Offers Up to 780K Bytes of Disk

SAN LEANDRO, Calif. — Imsai Manufacturing Corp. has introduced the Series VDP-4X, an intelligent terminal available in three versions: the VDP-40 with a disk storage capacity of 180K bytes, the VDP-42 with 400K bytes of disk and the VDP-44 with 780K bytes of disk.

A fully integrated system, the VDP-4X features an 8085 microprocessor, 32K and 64K bytes of random-access memory (RAM), dual 5.25-in. floppy disks, 9-in. CRT, keyboard and serial I/O in a desktop cabinet.

The VDP-4X comes with Imsai's Multidisk Operating System (Imdos) as well as utilities including an 8080/8085 assembler, video-context editor, dynamic software debugging program and floppy disk system diagnostic program.

The 780K bytes of disk is achieved by combining the Imdos disk formats with double-density, 77-track minidisk drives, the firm said.

The VDP-40, VDP-42 and 44 cost $4,495, $4,695 and $4,995, respectively, from Imsai, 14860 Wicks Blvd., San Leandro, Calif. 94577.

Micro Chips

Osborne Prints Primers On Assembly Language

BERKELEY, Calif. — Adam Osborne & Associates, Inc. has released two books, *8080A/8085 Assembly Language Programming* and *6800 Assembly Language Programming*, for microcomputer users who have little or no knowledge of Assembly language.

Also published is *Z80 Programming for Logic Design*, is a programming guide for the Z80 microprocessor.

This book deals with implementing digital logic with Assembly language and illustrates the proper microcomputer use, first by simulating digital logic sequences and then by demonstrating more efficient solutions.

All three books sell for $8.50 and can be purchased in local computer stores or from Osborne through P.O. Box 2036, Department X1, Berkeley, Calif. 94702.

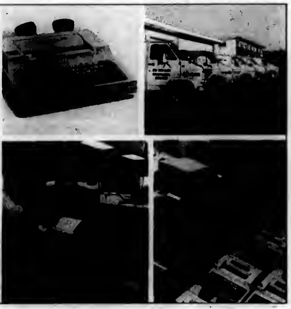
Directory Details Equipment Available to Pet Users

GOLETA, Calif. — Users of the Commodore Business Systems, Inc. Pet computers now have a reference directory of Pet-related products.

Published by Channel Data Systems, the directory includes information on software, hardware, literature and periodicals of special interest to Pet users as well as listings of user groups and distributors.

Cross-referenced by product type and supplier, the Channel Data book features updated supplements. An update service covers the calendar year of 1979.

The book and update service costs $19.95 from Channel Data Systems, 5960 Mandarin Ave., Goleta, Calif. 93017.



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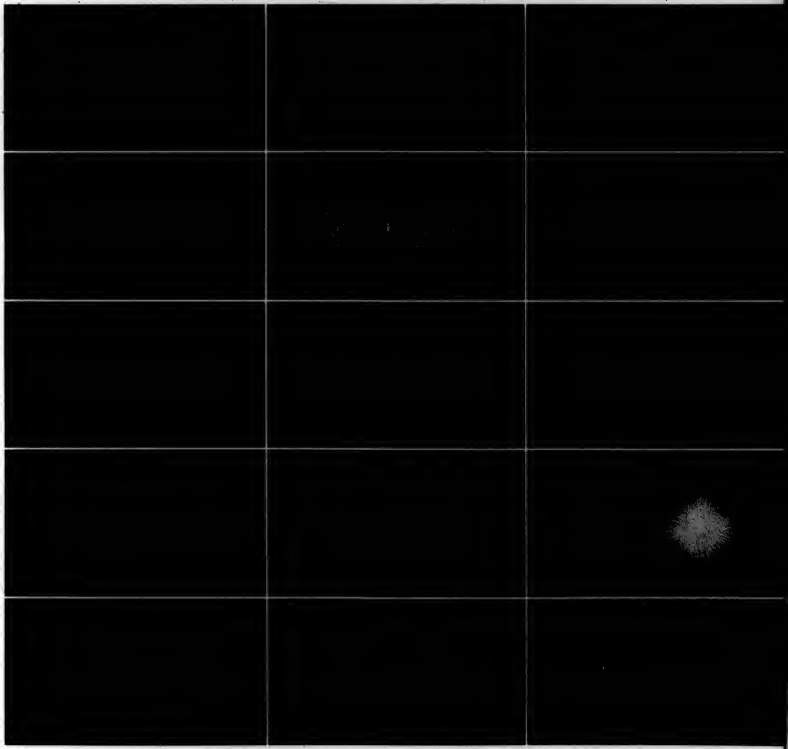
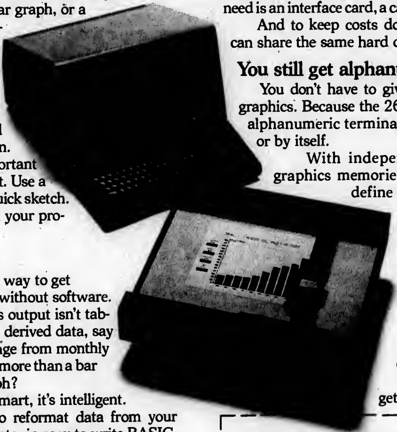


graphics software.

You just lost your last excuse for sticking with alphanumerics. Because with HP's new 2647A Intelligent Graphics Terminal, you get graphics without digging into your CPU's software.



A picture's worth a thousand numbers.

On an alphanumeric terminal, your data's just a screen full of numbers. But with the 2647A you can plot tabular data as a bar graph, or a pie chart, or a linear or logarithmic line graph. Quickly, with just a few keystrokes.

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What's more, with the 2647A you can zoom in and out. Pan right, left, up, down. Selectively erase. Shade important areas to make them stand out. Use a rubber-band line to make a quick sketch.

Without any help from your programming department.

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The 2647A's the smart way to get graphics from tabular data without software.

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Display Generator Bows

SANTA CLARA, Calif. — American Microsystems, Inc. has introduced a one-chip video display generator, called the S68047, which is compatible with S6800 and other 8-bit microprocessors.

The generator uses any commercially available RF modulator and can generate 14 types of display on American standard television sets, the firm said.

The S68047 circuit integrates four subsystems on a single chip that replaces up to 100 chips used in earlier display systems, according to the firm. The device features timing and control, multiplexing, address buffering and shift registers as well as an internal read-only memory (ROM) that generates a 5 by 7 dot matrix with a 64-character Ascii alphanumeric set.

The S68047 can be used for instructional devices, customer information, utility or process controls, safety applications, security and environmental controls, communications systems, routing and dispatching and games and personal computers, the firm said.

In addition to the alphanumerics, the S68047 offers semigraphics in two modes and full graphics in eight different modes.

The 40-pin S68047 costs $11 in plastic and $14.55 in ceramic packages from American Microsystems, Inc., 3800 Homestead Road, Santa Clara, Calif. 95051.

Peripheral Storage Device Attaches to System 8813

SANTA BARBARA, Calif. — Polymorphic Systems has unveiled the System 88/MS, the largest member of the System 88 family of microcomputer peripheral storage devices.

Designed to attach to the System 8813, the 88/MS provides additional storage for applications that require a large amount of storage at each workstation. Each 8-in. diskette has the storage capacity of seven of the smaller 5-in. diskettes supplied with the System 8813, according to the firm.

The device integrates two 8-in. floppy disk drives and power supplies in a desktop cabinet. Each diskette provides more than 630,000 bytes of nonvolatile storage. The controller card plugs into any unused slot in the 8813 backplane and the controller will handle up to four 8-in. disk drives.

Polymorphic System 88/MS

The proprietary disk format used in the 88/MS combines hard-sectoring and soft-sectoring and provides a 25% increase in storage capacity when compared with soft-sectored formats, the firm said.

The 88/MS with single-sided diskette costs $3,995; with double-sided diskette, $4,650, from Polymorphic Systems, 460 Ward Drive, Santa Barbara, Calif. 93111.

Basic Interpreter Suited to Z80s

PRINCETON, N.J. — Xitan, Inc. has introduced a Disk Basic XDB interpreter for use with Z80 microcomputers using a CP/M disk operating system in at least 32K of memory.

In addition to the features found in most Basic software interpreters, XDB supports a console, reader, punch printer and multiple disk files, the firm said. By using LOAD GO commands, XDB permits program chaining and program overlay operations and its Trace function provides a display of lines as they are executed, according to the firm.

XDB also supports additional mathematical functions LOG10, Fix, PI and EE as well as additional string functions. The XDB allows the programmer to intercept error conditions, perform global editing of a Basic program and use a privacy statement to protect proprietary source programs. Files may be opened in I/O sequentials, random-access or Update modes and all devices are supported in single-byte I/O, the firm said.

The XDB costs $159 from the firm at P.O. Box 3087, 1101-H State Road, Princeton, N.J. 08540.

Desktop Printers Produce 20 Columns

DAYTON, Ohio — United Systems Corp. has introduced the Digitec 6410 and 6420 desktop printers, which print 20 columns of alphanumeric characters first-line-up.

The Model 6410 provides a serial interface to RS-232C and 20mA current loop systems at 110 bit/sec and the Model 6420 works with 8-bit parallel bus systems at up to 1,000 char./sec. Both respond to Ascii input format, the firm said.

Both models cost $395 from United Systems Corp., 918 Woodley Road, Dayton, Ohio 45403.

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Progress Through Partnership

Cooperative VLSI Development Urged

By Molly Upton
Special to CW

LOS ANGELES — America must pool the technical resources of government, industry and education in order to successfully cross the threshold into the era of very large-scale integration (VLSI), just as it did in the development of the Eniac and Mark I, according to C. Lester Hogan, vice-chairman of Fairchild Camera and Instrument Co.

This country must also encourage entrepreneurs through changes in tax structures, for entrepreneurs will once again emerge as the leading companies in the electronics business, Hogan said in the keynote address at the recent Western Electronic Show and Convention (Wescon) here.

Gracefully declining his usual custom of predicting significant happenings in the semiconductor industry, he said, "for the first time in 20 years, the near term is not a simple extrapolation of the past."

Instead, he used his dais to lay the groundwork for accepting the concept of cooperative VLSI development with funding aid from the Department of Defense.

Funding Seen Certain

In a later discussion, Hogan said he thinks funding is almost 100% certain and added he has been working for about a year to sell the government on the concept.

During a Wescon session, Dan McMillan, publisher of *Electronics Magazine*, said the Pentagon may allocate $200 million for R&D in this area.

The research necessary to reach the VLSI plateau is enormous, Hogan said, citing needed work on lithography, both X-ray and electron beam direct write, dry plasma etching and testing. "The idea of testing one million components on a chip is beyond imagination," he observed.

Political leaders must understand that progress comes through partnership, he said. "The technique of achievement is clear from examples such as the development of the first computers and the sharing of knowledge about the transistor, which was the key element in making computers the pervasive element they have become," Hogan said.

"The question is: Do we finally have the wisdom to follow the success of the past? Do we yet have the will to win in this exciting technology?

"We stand at the threshold of VLSI and tremble at the threat of the Japanese," he said, not moving forward, but worrying instead. "We've lost the memory of what made us great or the will to success." Hogan indicated that the Japanese challenge, while real, can be met.

CW
At Wescon

"The greatest fear is not from the Japanese, but from ourselves," he told Wescon attendees.

Hogan agreed with an IBM pamphlet that pronounced these times as the age of computation. Although nearly every other discipline — medicine, geology, astronomy, agronomy — has made advances as significant as those of DP, many of those achievements would not have been possible without the computer, he pointed out.

The computer must be the most pervasive element in other fields, and there has been no other synergistic growth as significant as that of the computer and semiconductor, he stated.

"The single most important achievement of man in my lifetime is the development of the computer, and the single most significant contribution to make it pervasive was Bill Shotley's paper" on junction transistor theory, Hogan said. The concept of a computer had been around for years, but the breakthrough of the transistor made implementation possible and feasible.

Bell Labs shared its knowledge of the transistor in an atmosphere of cooperation, he noted.

Three Eras

Within the Age of Computation, there are three distinct eras: the transistor, 1950-1960; integrated circuits, 1960-1978; and, now and in the future, VLSI.

The future of the industry is difficult to predict and in that respect more resembles the era of the transistor than the era of integrated circuits, he said.

The industry has matured to the point where marketing has become a factor. In the

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Devaluation Offers Expansion, Makers of Components Told

Special to CW

LOS ANGELES — American components manufacturers should use the devaluation of the dollar — and the resultant low prices — to their advantage and expand their marketing operations worldwide, according to two panelists at the Western Electronic Show and Convention (Wescon) marketing conference here.

The session topic was "The Impact of Foreign Manufacturers on the American Electronic Components Market — How Will It Affect Your Growth and Market Share?" However, moderator Jack Darcy, president of Kierulff Electronics, joked that a more appropriate title might have been "Son of World War II." Indeed, the lines were clearly drawn among the panelists.

The Japanese were represented by Jack Ordway, vice-president of Hitachi, Ltd., and Jason Stewart, vice-president and general manager of NEC America, Inc. They maintained that the U.S. semiconductor industry has been receiving government subsidy and cannot cry foul at the funding the Japanese government is providing its country's semi efforts.

They also cited statistics showing the U.S. semi makers have a larger relative market share in Japan — 10.1% — than do the Japanese in America (3.3%).

E. Floyd Kvamme, vice-president and general manager of National Semiconductor Corp., upheld the free trade position long advocated by his firm. He countered the Japanese firms' use of statistics by pointing out that what is significant is the total number of components in finished products.

If one looks at the end product in the consumer goods sector, there are more Japanese semis in the U.S. today than American semis in Japan, Kvamme said.

But while people are focusing on the situ-

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Component Opportunity Seen in Devaluation

(Continued from Page 77)

ation in the U.S. and Japan, they should remember that there is enormous opportunity in the worldwide market. Fifty percent or more of the components market lies outside of the U.S. and Japan, he told the more than 300 session attendees.

In order for the principle of free trade to work, it must be operative worldwide, Kvamme stated.

The two other panelists focused on the opportunities abroad. Thomas J. Roper, marketing manager of Union Carbide's Electronics Division, and Dan McMillan, publisher of *Electronics Magazine*, told the audience to go out and hustle in the rest of the world instead of sitting at home.

'Out-Thought, Out-Sold'

As foreigners develop advanced integrated circuits, their electronic markets will mushroom, making new opportunities for the U.S., McMillan said.

Roper observed there is an "opportunity for the U.S. to emerge as the undisputed leader in world trade," but it must base strategy on a clear understanding of the workings of international trade, as have the Japanese.

"We are out-thought and out-sold," Roper said. Americans have taken actions, "deliberate, naive or stupid," that have helped the Japanese market share grow, he added.

Basically Americans gave away medium and low technology markets such as TV and copiers because they were more interested in high-technology products, Roper said.

Japan has won the trade war in the '70s because for Japan exports are vital; it has no raw materials of consequence, he continued.

World Market Forces

Roper said it is critical to understand the forces at work in the world market. Although the U.S. balance of payments situation is serious, it is grimmer for Japan and Europe because they are more dependent on exports for their economic well-being, he explained. This leaves the U.S. the only major industrial nation still importing strongly.

Focusing on the pervasive influence of payments for oil, Roper predicted the market for components should grow as oil-rich companies invest in developing nations.

McMillan observed foreign governments are funding development of components because they realize they "cannot have a well developed industrial society unless they can make advanced ICs. Foreign governments are paying about $1 billion over five years for this expertise," he stated.

Estimates indicate Japan is pouring $250 million into its very large-scale integration (VLSI) program; Korea is funding $25 million; France, up to $225 million; Italy, about $135 million; Germany, as much as $200 million; and the UK, $300 million.

The U.S. may also join the trend with a $200 million investment, he said.

Foreign governments will continue to invest in U.S. companies because even at twice the market value this is the cheapest way to get into technology, McMillan stated.

"Does foreign participation in this technology represent a threat or an opportunity?" he asked.

As foreigners develop ICs, their electronics markets will grow, presenting an opportunity.

In addition, this will create a pool of potential employees, so perhaps the U.S. can reverse the grain drain from Texas to London, he suggested.

Foreign nations will take market share away from the U.S., McMillan said and Americans will help that happen. "Our distributor set up works to their advantage, and they are better international marketers than we are."

Net Result Not Too Bad

"Will our overseas market share drop? Almost certainly, but the market will expand," so the net result won't be too bad, he concluded.

Companies should create the funds from within to grow rather than having to look abroad for money, McMillan suggested. The electronics industry is attempting to get Congress to roll back capital gains taxes to the 1969 level, he said.

"It's a new ball game." Dollars are deteriorating because of the oil situation and "you're going to have low prices and that will have an overriding impact on your business," McMillan said.

Motorola, French In Joint Venture To Make MOS

CHICAGO — Discussions between Motorola, Inc. and Thomson-CSF of France to form a joint venture for the production of metal oxide semiconductors (MOS) are at the "advanced stage," according to officials of Thomson-CSF.

While Motorola's president, William J. Weisz, denied at a recent news conference in London, that the talks were near completion, French sources said a decision on the venture will probably be made early next month.

Officials indicated the French government will supply a $150 million subsidy for a semiconductor venture.

If it were consumated, the Motorola-CSF-Thomson venture would probably receive a government subsidy of $80 million, sources estimated.

Competition Sought

The negotiations are part of an effort by the French government to spur competition in France's microelectronics market.

In particular, the government is said to be seeking foreign expertise to boost national production of semiconductors in France.

In addition to providing aid for private ventures, the French government is said to be completing work on a government-operated semiconductor company, Societe Europenne de Circuits Integres MOS (Semicos). Talks are being held, French officials said, with selected U.S. companies which could become partners in Semicos.

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Japanese Impact Held Positive

U.S. Semi Sophistication Luring Foreigners

LOS ANGELES — The sophistication and innovativeness of the American semiconductor market have attracted entrants from abroad, two representatives of Japanese firms told a marketing session held with the recent Western Electronic Show and Convention (Wescon) here.

Other countries need to compete in an innovative market in order to make their development efforts relevant; NEC America, Inc. and others have no choice but to focus on this market, according to Jason Stewart, vice-president and general manager of NEC's Electronics Division.

Although American companies may not entirely welcome Japanese competition, Stewart reminded them that the electronics industry is truly international, a characteristic pioneered by American semiconductor firms that went off-shore for inexpensive labor.

Stewart and Jack Ordway, vice-president of Hitachi, Ltd., focused on the positive impact on the American economy that Japanese firms could make.

Charges Against Japanese

Before countering accusations that trade between Japan and the U.S. is a one-way street from Japan, Stewart outlined the charges against the Japanese:

- Japanese manufacturers have unfair advantage because they receive funding from the government.
- The unequal barriers prevent export to Japan.
- Nontariff barriers prevent export to Japan.
- Japanese companies are exporting jobs.

The subsidy issue has "grossly distorted normal competitive conditions and commercial criteria in the U.S. It is difficult to imagine other countries developing semi expertise without subsidy," Stewart said.

The unequal tariff is a matter of record, he said, pointing out that although Japan's tariff is 12% compared with the U.S. 6%, the Common Market countries' tariff is 17%.

Furthermore, tariffs are not effective in isolating markets, he continued, noting that the imports of U.S. semis to Japan are three times those of Japan to the U.S. and the U.S. has dominated the Common Market semi market despite the high tariff.

The nontariff barriers, such as cultural and buying patterns, are highly exaggerated, Stewart contended. The saying that "blood is thicker than yen" just isn't true; the Japanese are too astute as businessmen, he said.

American seminconductor firms haven't really made the effort to sell in Japan because they have been busy in America, he said.

U.S. companies must make the effort to understand the Japanese. "Japan is open to those who make the effort," he emphasized.

Often the failure to penetrate the Japanese market is a failure to meet high standards that are demanded, he continued. For instance, the reason NEC went in-house was the quality of available products was inadequate, he said.

Stewart countered the charge that the Japanese are exporting jobs by noting that U.S. firms went off-shore for production. Now — conversely — Japanese firms are establishing facilities in the U.S. in recognition of the need to provide service as well as sales in this country.

NEC has established a facility to manufacture telephone gear in Dallas and is in the process of buying electronic arrays, Stewart observed. Hitachi is establishing a plant in the Dallas area that initially will make MOS memories, Ordway stated.

Export Statistics

Ordway used statistics from *Dataquest* to show that U.S. semiconductor exports to Japan from 1975 to 1977 grew 60% faster than imports from Japan (52%).

Imports rose from $56 million to $85 million while exports grew from $102 million to $164 million.

CW At Wescon

The total size of the U.S. semi market in 1977 was $2.6 billion, of which the Japanese held a 3.3% share amounting to $85 million. The Japanese semi market was valued at $1.6 billion, of which the U.S. held a 10.1% share or $164 million, he said, citing *Dataquest* figures.

U.S. companies hold a 3:1 advantage in market position and a 2:1 advantage in dollar sales, Ordway commented.

Looking at the Semiconductor Industry Association's figures for bookings in the first and second quarters of 1978 vs. 1977, Ordway observed orders for U.S. goods from the Japanese are growing faster than U.S. orders from U.S. customers.

In the first and second quarters respectively, U.S. orders from U.S. customers grew 16% and 28%, while U.S. orders from the Japanese grew 55%

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EDP professionals have a word for the new Wang VS computer.

Richard Berger, Vice President and Data Processing Manager, Bugheus, Inc., a Volkswegen service center network heedquartered in Hertford, Conn.

"Because we had been using a computer—the Burroughs B1700—with card input sequential files and no video displays, we suffered long delays and storage constraints.

"Now, with our Wang VS system, storage is virtually unlimited, and we simply recall a screen load of information on the CRT to make a change in seconds—all of this without interrupting our normal flow of work.

"We've put everything in our business onto our VS system, including payroll, accounting, sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs."

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational on-site on February 15, with 61 programs written, debugged and tested—all by only two people—and not a single line of code had been written until the machine came in the door.

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance, language-availability, user-utility software.

"I think the real key for the DP manager is the utilities available with the VS, its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

J.P. Scott, Deta Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pe.

Kenneth W. Cakebread, Manager of Deta Processing, Trans-Air Forwerding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system. Not only did I do it; Thanks to the programming power of the VS, I actually came up with more

"Before we converted to the VS, the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information end keying it into the computer from a workstation, we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities, I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second.

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Hogan Urges Cooperative VLSI Development

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past 18 years, he said, "for whatever we made, we found a customer."

But the industry is approaching the point where it is market-driven; it's what makes sense from a marketing view that is essential.

Citing the 1971 breakthrough of a microprocessor — an entire computer on a single chip — Hogan asked, "But after you have a powerful mini on a chip, is the future as obvious as the past? The evolution of a Cray on a chip won't happen because there is no market."

So the era will be very risky for management. "There will be vertical integration, but we will see great failures and successes, as in the past. The next 10 years will be risky for management as it wrestles with the attractiveness of the products that can be built," Hogan said.

He cited instances where the Japanese have proved adept at carving niches in the mid-range hand-held calculators and digital watches.

The challenges will come from entrepreneurs, the same breed of people who in the '70s became millionaires in telecommunications right under the noses of the entrenched equipment companies and the semiconductor firms. Foreign companies will also provide challenges.

Threat Exists

Hogan briefly decried how open the U.S. has been with its market and its technical knowhow and how closed Japan is to American technicians and companies.

A threat exists because "the new era demands new design, new approaches to marketing, and we seem to have forgotten what made our country great."

Reminiscing about the transistor era, Hogan said it was "one of the riskiest periods for a semiconductor company's management. The technology was almost too dynamic," and new, far superior technological advances tumbled out of the laboratory every few months.

"Many managements waited too long, in the belief they could decimate Texas Instruments" when they decided to act.

Even when they did act, as in the case of Philco, which spent $75 million on equipment to make transistors, they were outmoded by technical advances; silicon came along.

But the integrated circuit era was more evolutionary. Once the planar process was developed in 1959, advances were relatively easy to forecast. Hogan cited Gordon Moore's Law that industry would "double the number of components on a chip of silicon every year."

The prediction has proved remarkably accurate — 64K random-access memories with about 135,000 components on a chip are now being built.

This era was not risky for management; marketing did not pose a large risk as there was a customer for whatever the labs could turn out, which were in sequence, a gate, a flip-flop register and half adder (because full adder yields were zero).

Referring to the density of components on a chip, Hogan said, "Obviously we're going to get in trouble; we're going to run out of steam" and may fall back to doubling every two or three years.

Upton is managing editor of EDP Industry Report, *a publication of International Data Corp.*

Greyhound Boosts Offer for DCL

PHOENIX — Greyhound Computer Corp. increased its bid for DCL, Inc. to $5 per share for each of DCL's outstanding 3,367,000 shares.

Last month DCL rejected what it termed an informal merger proposal from Greyhound, which planned to offer $4.50 a share for the company's stock.

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IEEE Concerned by Slowdown of Research

Special to CW

LOS ANGELES — The U.S. economy is experiencing a decline in risk-taking, which has resulted in less long-term research and development. "Since 1965, there has been much less risk-taking, and it's as if, almost overnight, we became a middle-aged country," Prof. Burton Klein of the California Institute of Technology observed here recently.

Klein spoke during a Western Electronic Show and Convention (Wescon) session entitled "Ebbing U.S. Innovation: Foreign Trade and Jobs."

The long-term impact of the decreasing rate of U.S. technological innovation is a major concern of the Institute of Electrical and Electronics Engineers (IEEE), according to Bruno O. Weinschel, vice-president of professional activities of IEEE.

Panelists agreed that the decreasing amount of long-term, high-risk development effort not tied to a specific product ultimately signals a slower economic growth rate for the country. As an example of the opposite reaction, Weinschel cited research done on the transistor as triggering significant economic growth.

CW at Wescon

The problem should be tackled from both the private and government sectors, the panelists suggested. A multitude of tax changes are needed to encourage investment in small firms and to enable established firms to grow.

On the public side, the government is becoming increasingly involved with the problem and is currently assessing the impact of government policies on industrial innovations, according to Howard Sorrows of the Office of Science and Technology in the Department of Commerce.

Within the next year, a Cabinet-level committee, chaired by Commerce Secretary Juanita Kreps, will present a position paper to President Carter, Sorrows said. This will be the largest government undertaking concerned with innovation, he claimed.

To aid in this effort, the IEEE has formed a task force for propagating innovation in technology. Consultant Sam Raff, also a Wescon panelist, is chairman of that committee.

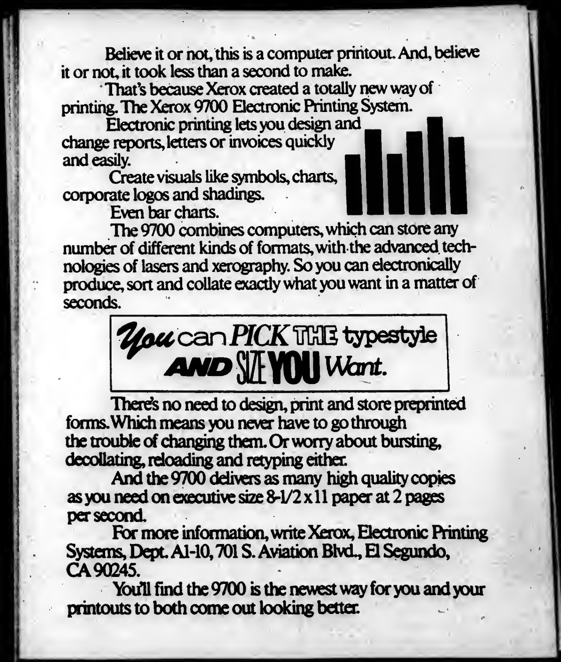
Klein blamed a significant part of the declining investment in R&D on the tendency of "policy makers to think of stability in narrow, static terms, which makes for a less dynamic economy."

Recognizing that changes originating with the government may be a few years off, the panel looked at what private industry could do to change management attitudes toward innovation. At present, management is focusing on "skimming the present at the expense of the future," one panelists noted. They accused modern managers, categorized as lawyers or M.B.A. types, of being "experts in not taking risks."

In contrast, most of the management of the high-growth, technological firms were originally technical people turned entrepreneurs. This was also the case in England in the 1840s and 1850s; by 1910, accountants became managers and growth slowed, Klein remarked.

Incentives in the private sector are not linked with long-term results, Raff observed, noting that if future pensions depended on the future earnings of the company, management would have some incentive to invest in R&D.

Klein claimed that pay structures and benefits are oriented to the long-term employee, therefore encouraging workers to "keep their heads down."



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Compuserve Inks First FM Pact

COLUMBUS, Ohio — Compuserve, Inc. and Amax, Inc. have signed a $2.5 million, five-year facilities management (FM) agreement to begin the third quarter of this year.

Under the agreement, the first of its kind for Compuserve, Amax will lease a KL-10 computer manufactured by Digital Equipment Corp.

The computer will be housed at Compuserve's DP center in Dublin, Ohio; 24-hour maintenance of the computer and technical support for certain software programs used by Amax will be provided.

Amax will also have access to Compuserve's library of programs and security system.

The arrangement will permit Amax to expand the use of various mine planning and project management programs by having direct control of computer operations and the scheduling of programs. The company runs more than 4,000 programs, including complete systems for deposit evaluatings, metallurgical analysis and corporate financial planning and review analysis.

United Telecom Acquires Calma

KANSAS CITY, Mo. — United Telecommunications, Inc. has acquired Calma Co., exchanging 1.43 shares of its common stock for each share of Calma.

Calma will operate as a division of United Computing Systems, Inc., a subsidiary of United Telecom.

In other company activities, United Telephone Co. of Ohio, a wholly owned United Telecom subsidiary, filed a registration statement with the Securities and Exchange Commission for a public offering of $35 million of first mortgage bonds due 2008.

U.S. Luring Semi Makers

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and 108% respectively, he said.

But lest the audience be persuaded by the Japanese point of view, E. Floyd Kvamme, vice-president and general manager of National Semiconductor Corp., had the last word.

"It is important to recognize that component data is meaningless" because one must count the total number of components in the final goods, Kvamme said.

"We must learn from history what it means to be a target industry of Japan. Remember, the semiconductor industry is not the target; DP is," he cautioned.

Americans should focus not on the component level, but on the health of the manufacturers of the final products. For example, U.S. telephone gear should be allowed to be hooked into the Japanese telephone system," he said.

Japan does not need the protection it has and should be open to trade, Kvamme said. For the first time in modern history, in 1978 the U.S. may be surpassed in gross national product per capital — by none other than Japan, he added.

Free trade is essential to the routine growth of the semiconductor industry, he said. The problem is that Japan has interpreted the Gatt regulations, which were based on the principle of comparative advantage, different from others. And others are imitating Japan, which results in a repudiation of free trade, Kvamme concluded.

Supershorts

For the first time Prime Computer, Inc. has entered into a joint marketing agreement. Prime and Management Decision Systems, Inc. will provide an information analysis and modeling system called Express for Prime's 400 and 500 systems.

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McDonnell Douglas Automation Co. has granted exclusive marketing rights for its computer services in Scandinavia to Datema AB, a subsidiary of the Axel Johnson Group.

– – –

Control Data Corp. was selected as the recipient of the Service Award of the American Society of Training and Development for its Plato computer-based education system.

– – –

Randal Data Systems, Inc. has started developing international sales. However, the company will not sell its products directly to the public, as has been done in the U.S., but will develop a network of independent distributors.

– – –

Decision Data Computer Corp. recently celebrated the shipment of its 1000th Model 6600 line printer.

– – –

Lear Siegler, Inc. has established a Data Products Division headed by Lee Falco Jr. which will manufacture and market its line of general-purpose CRT terminals and matrix printers. The line was formerly part of the company's Electronic Instrumentation Division.

– – –

Sopra, a French computer services company, will market and service System Design & Development Corp.'s distributed data processing software products for the IBM Series/1 in France.

– – –

Pansophic Systems, Inc. has opened a central training facility. Three conference rooms equipped with audiovisual and instructional aids and a capacity of 60 people make up the core of the training facility.

– – –

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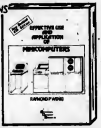
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All candidates must be able to program for the 3705 Communications Controller. Successful applicants must have heavy experience with VTAM and assembler language.

Responsibilities for this position include the designing and creation of specifications for the host computer on-line applications— interfacing with the communications handling program, and the testing, programming and implementation of these applications. You will also install and maintain the systems software and applications that run on front-end communications processors and remote concentrator computers.

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We're looking for college graduates with a minimum of two years' experience in the design, implementation and maintenance of data communications software and hardware. A background working with IBM access methods, teleprocessing monitors, and front end software is desirable. Working in comparable areas on other large mainframes or minicomputer systems may be substituted. Four years' experience may substitute for a degree. Exceptional written and verbal communication skills, and the ability to work effectively with minimal supervision are all required.

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Junior and Senior positions for SYSTEMS ANALYSTS with MULTICS and other operating systems background, including strong programming knowledge of FORTRAN, PL-1 or COBOL on CDC, IBM, and Honeywell 6000 series computers. BS or MS in mathematics/computer science required. Send resume to Ms. Godding at address above

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Experience in performance assessment of radar acquisition and tracking systems, with minimum of BS degree in engineering or science. Background in test planning, design, and data analysis. FORTRAN IV experience essential. Send resumes to Jeff Garton, The BDM Corporation, 2600 Yale Boulevard, S.E., Albuquerque, New Mexico 87106.

INSTRUMENTATION/DATA SYSTEMS

Positions for engineers with experience in instrumentation and data processing systems, PCM, NBFM, WBFM, signal conditioning, and instrumentation installation. Familiarity with data processing techniques highly desirable. Send your resume to Jeff Garton at the Albuquerque address above

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We seek a qualified individual to fill this key position in our Richmond headquarters. Will assist in the analysis, development and programming of computer systems on an IBM 370/135, DOS/VS. Prepare necessary systems and program documentation. Must be able to communicate effectively with users; and program proficiently in ANSI COBOL. BASIC and Teleprocessing a plus. Degree preferred with experience in programming and systems analysis.

Liberal starting salary. Excellent benefits. Reply in writing stating qualifications to A.J. Falco, Personnel Manager

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Computer Architecture Researchers

We need several architecture specialists to explore architectural alternatives and develop metrics by which they can be evaluated. You will maintain expertise on a wide range of actual and proposed computer architectures, and be able to relate new proposals to them. Other responsibilities will include proposing and critiquing designs and comparing them to alternatives in terms of cost, performance, reliability, and complexity of implementation. You will keep your expertise up to date in view of changing component technologies, evolving user requirements, and improving tools, methods and theoretical insights.

These positions require extensive knowledge of relevant technical areas. Also required are a Ph.D. in computer science or equivalent and related practical experience.

Software Methodology Researcher

Conducting research in the area of software modules, your initial focus will be on the use of software modules to construct software systems in a lab environment. Other problems to be addressed include module specification methods, interconnection and coordination of modules, and the design of tools to enable users to build systems with software modules.

Requires are a Ph.D. or equivalent in computer science and a strong background and interest in software engineering.

Researcher in Natural Language Data Base Systems

You will investigate, design, and implement a prototype natural language interface to data base systems. Our goal is to produce a data base system that can be used effectively by professionals who have little or no knowledge of programming.

This position requires a Ph.D. or equivalent in computer science, familiarity with current natural language systems, and knowledge of data base concepts.

Security and Protection Researcher

Your research and consulting will focus on the use of security kernel structures and formal verification techniques in the implementation of secure systems. You will advise on the potential for modifying or re-implementing current products as well as guiding the development of new ones. You will also act as security/protection consultant to development and product line groups.

You must have a Ph.D. in computer science or equivalent. Experience in the design or kernelized secure operating systems, in formal verification methods, or in security models is also required.

Data Compression Consultant

Your principal responsibilities will be to apply known techniques for data compression to practical problems and to introduce this technology to various areas of the company. Working from the R&D group, you will serve as a consultant, do prototype implementation, and look for opportunities to exploit data compression in both our products and our internal operations.

You must have knowledge of both the underlying theory and the practical applications of data compression. Your experience should include substantial programming and computer use. Additional depth and breadth of computing knowledge would be an asset. Your long term potential as a productive member of a research group is also an important factor.

Human Factors Researcher

You will perform research and consult within the corporation on the design and specification of computer hardware and software with respect to the physical, cognitive, and perceptual aspects of men/machine interaction.

Required are a Ph.D. in experimental psychology, familiarity with computer systems and programming, and at least 3 years experience in applying human factors principals to computer systems.

Applications Programmer
Office Automation

Working at the leading edge of an important new applications area, you will impact our office automation research program by developing experimental applications software.

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If you're interested in research at a highly advanced level, contact Digital today. Please forward your resume to John DiPietro, Digital Equipment Corporation, Dept. B925, 3807, 146 Main St., Maynard, Mass. 01754. We are an equal opportunity employer m/f.

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Pacific Telephone offers you the opportunity to be part of a specielized group supporting large Burroughs installations. Your primary reaponsibility will be to increase the efficiency of the systema hardware and software plus preparing cost analysis and justification of herdware for new applications. The positions also require interfacing with operations people, applications programmers and vendors.

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Career opportunities now available with a progressive Data Processing Organization in one of the fastest growing financial institutions in the Southeast. Current environment includes Twin IBM 370/158's OS/VS1, batch and on-line applications. We have immediate openings for the following:

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Requires 2 to 5 years experience, ANSI COBOL, OS/JCL and OS utilities. BAL knowledge helpful.

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Minimum 2 years experience on CICS/VS, VTAM, NCP. Understanding of SNA helpful.

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Requires 2 to 5 years experiance in tactical and strategical planning and feasibility studies. Knowledge of programming beneficial.

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Today, Incoterm is one of the world's leading suppliers of large on-line interactive distributed data processing systems, with a reputation for quality and service unmatched in the industry. Our capabilities and potential growth have been significantly enhanced through our recent association with Honeywell Information Systems. Major new hardware and software systems are currently under development with additional programs scheduled through the 1980s.

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Within the next four months we plan to increase our professional staff by 15 percent and anticipate almost doubling it by the end of 1979. Our anticipated growth in existing markets and penetration into new market areas has created a need for software, hardware, and marketing professionals of demonstrated ability who can contribute and grow with us. The challenges will be numerous. Involvement will be at the state-of-the-art level. And the rewards will be substantial.

If you are seeking a company that will be responsive to your professional needs, recognizing that its ability to meet its goals depends upon the enthusiastic contributions of its people, let's get together. We'll demonstrate our ability to meet your needs.

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A small, friendly, highly cohesive group, we're dedicated to creating sophisticated value-added software and to building accurate, advanced diagnostics for testing and rectifying new systems. Here you'll have first contact with our latest products in a professional environment where your individuality can thrive. If you seek extensive customer contact and state-of-the-art involvement, Systems and Applications will more than meet your needs.

Applications Programmers

We need several individuals at most levels to participate in a wide variety of customer specific and standard software projects such as banking systems, data entry, airline reservations and similar real-time terminal applications. You will have the opportunity to work in diverse areas and to interface extensively with users' technical personnel.

Required are 3 years real-time assembly language and minicomputer experience. Exposure to communications, teleprocessing, remote batch, IBM 3270, Burroughs TD820, Uniscope 100/300, and/or VIP 7700 would be helpful.

Diagnostics Programmers

In these mid- to senior-level positions, you will be responsible for the development of comprehensive diagnostic routines for a variety of processors, peripheral devices, and applications for our current product line and for new products. You will be the first to have programming contact with our latest advances, employing such software as off-line diagnostics, test operating systems, fault detection monitors, and special purpose test bed programming.

You should be equally comfortable in an electrical engineering, as well as a software development environment and be ready to apply both disciplines to this important function. A knowledge of assembly language and experience with LSI and semiconductor devices is required.

ADVANCED SYSTEMS DEPARTMENT

Advanced Systems is responsible for developing software systems compatible with our new hardware products, including a new distributive data processing network-oriented terminal system. Involvement here satisfies the needs of professionals who demand the highest level of technical interface. In a genuine ground-floor environment, you can help to make significant architectural and product decisions in the following areas:

Compiler Development

The ability to work and communicate with others and to contribute to a group effort is central to your success in this highly demanding compiler development position. You will need a BS or MS in computer science and at least 3 years experience in compiler development. Also required is one block structured language such as ALGOL, PL/1, PASCAL, C, or BLISS.

Operating System Development

You will undertake responsibility for the design and implementation of operating subsystems, and contribute to the overall requirements definition of the operating system. You must be capable of implementing thorough knowledge of controlled file access, multi-level directory systems, and sequential, random, and index sequential access methods.

The successful candidate will have a Bachelor's degree in computer science and 3 years experience. You must have participated in the design and implementation of an operating system, and a working knowledge of data base systems and requirements is desirable.

Leader, Operating System Development

Employing your strong technical knowledge and good managerial and leadership skills, you will undertake full responsibility for the design and implementation of the operating system. You must have at least 6 years experience including prior participation in the design and implementation of an operating system. A working knowledge of contemporary minicomputer-based operating systems is desirable.

Verification

You will have responsibility for ensuring that a quality systems product is developed. Specifically, you will develop, construct, and execute test programs and participate in design, code, and specification reviews of new software products. In addition, you will help monitor the building of the system in order to rapidly identify schedule inaccuracies and conflicts.

Required are a strong technical background in systems software and at least 2 years experience in developing and/or testing systems software. Your most recent experience should be in the area of compilers or operating systems. A strong background in mathematics is desirable.

Senior Technical Writer

We need a technical writer to produce internal and external system documentation using information obtained from formal design discussions and specifications. Additionally, you will help to establish documentation plans and identify documentation requirements as well as coordinating production of completed manuals.

You must have a strong technical background in systems software and at least 2 years experience in technical writing for a computer manufacturer or software vendor.

Firmware Programmer

This individual will write firmware programs for new state-of-the-art microprocessors. You must be hardware and software savvy, super-competent, and intelligent. You must be a perfectionist who can spend hours reading a single line of code out of two hundred. You need not have experience in this area, only the certainty that you can handle this demanding position.

ENGINEERING DEPARTMENT

Ours is a small, friendly department engaged in numerous highly challenging projects. If you want to work in an environment where you will be given design freedom and your contributions will be noticed, then Incoterm's Engineering Department is the place to work. We have several opportunities in the area of hardware development for qualified professionals who wish to engage in projects of maximum impact.

Mechanical Design Engineers - All Levels

Your responsibilities will include the design of CRT Terminals, Processors, sophisticated Automated Banking Equipment and special purpose terminals utilizing state-of-the-art electro-mechanical technology. Required are a BSME or equivalent with experience ranging from a desire to 10 years in computer oriented packaging. You will be exposed to design in plastics, castings & sheet metal, backplane interconnection techniques, and the design of paper handling devices/mechanisms.

Product Support Engineers/Mechanical

The successful candidate will provide design engineering support in the resolution of problems encountered by our manufacturing and customer service groups. Participation in design reviews, new product introduction, vendor surveys, and the continued maintenance of design integrity are key elements of the responsibilities of the positions.

Required are a BSME or equivalent with related experience in the commercial/military electronics industry. A thorough knowledge of electro-mechanical fabrication and assembly techniques is also required.

Product Support Engineer/Electronic

Providing digital capability in a product support capacity, you will interface closely with design engineering, quality assurance, customer service, and production to construct innovative solutions to unique problems.

Required is a BSEE or equivalent experience. Microprocessor experience would be helpful.

MARKETING

Our marketing efforts require the aid of several top marketing professionals capable of producing solid, successful results in the following positions:

Manager, International Marketing Services

The successful candidate will have responsibility for administration and service support requirements within International Marketing. These requirements include maintenance of pertinent marketing and administrative reports, advertising, market research, shows and exhibits, dissemination of sales aids, and market planning. You will also maintain such reports as booking summaries, monthly marketing forecasts, monthly significant business lists, six month equipment shipment forecasts, and sales projections.

Market Support Specialist/Banking

Providing support to the International Marketing department in sales activities, you will generate proposals, coordinate software development, and analyze the unique requirements of the marketplace as they relate to product lines. Additional responsibilities include providing technical interface for banking customers, program management, and distributor organizations, as well as maintaining a comprehensive profile on competitive technical and price postures.

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Product Support Specialists

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FOR OUR OPERATIONS IN LOWELL

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Entry level positions require 1 to 3 years of Programmer/Analyst experience with a good command of COBOL, on-line development experience and concentration in one of the following industry areas: Brokerage, Direct Mail, Distribution, Leisure Time, Market Research or Retail.

Senior candidates should possess diverse business experiance and skills in Administrative as well as Application Systems. Recent experience in an ACME/Big 8/internal consulting environment would be a plus.

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Compensation ranges from the mid-teens to mid-thirties and includes exceptional profit sharing plans as well as fringes. Career growth is based upon performance.

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Information Services Manager
The Bradford Exchange, Ltd.
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Niles, Illinois 60648

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or have extensive assembly language on any of the above computers.

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John N. Powers at the address below

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If you are an experienced O/S programmer, consider developing software for the STAR 100, one of the largest and most advanced virtual memory and string array processing computer systems in the industry today. Positions involve detailed design, implementation and documentation of new STAR O/S features and improvements. A working knowledge of FORTRAN and Assembly language are required.

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Control Data offers a challenging and rewarding work environment and with us you will receive recognition and technical growth. We provide excellent compensation and comprehensive benefits, including dental and retirement plans. Qualified candidates are invited to send resumes, stating position of preference and salary history/requirements (only those resumes with salary history/requirements will be considered) to Karan Hardy, 215 Moffett Park Drive, Sunnyvale, CA 94086. (408) 734-7434. An affirmative action employer, M/F.

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DATA PROCESSING

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(Petroleum)

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The second position involves building information processing systems which will control exploration and exploitation processes. You should have extensive design and utilization background, and industry and the geological or geophysical fields. Candidate should know Fortran, and Masters Degree in geology or geophysics is preferred.

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Data Processing

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PROGRAMMER ANALYST

Our Computer Center seeks programmer/analyst with 2-4 years experience in design and programming of on line systems operating under IBM DDS or DOS/VS. Financial systems development experience a plus but not an absolute requirement. Excellent growth opportunity in new installation.

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Salary commensurate with background and experience.

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Tucson Gas & Electric has vacancy for an Engineering Programmer. Individual will be responsible for the development and maintenance of engineering and scientific data processing applications. Successful applicants must have the following: college degree in engineering or mathematics and two years of programming engineering or scientific applications or the equivalent through combination of education and experience. Also required is at least two years of work experience with FORTRAN; in addition, a working knowledge of COBOL and 370/OS/VS is desirable.

Beginning salary range about 16K. Outstanding benefits.

Submit resume and salary history to
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Attn: Personnel Dir.
P.O. Box 711
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AA/EOE

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VTAM VSAM TSO Data Dictionary

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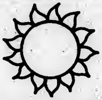

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BS or MS in Business Management and/or Computer Science with background in statistics is the relevant educational background needed. Three to five years experience is required in planning and developing complex Information Systems using teleprocessing terminals and Micro's. You should be experienced in applying small computer equipment and office equipment/PBX.

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EDP professional, preferably with experience in real estate title insurance or related field, wanted to participate in major systems development program of national title insurance underwriter. Thorough knowledge of EDP as well as ability to communicate and interact with management and user personnel is required. Send resume including phone number, salary history and requirement to: Vice President - Administration, P.O. Box 01-5002, Miami, FL 33101.

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Requires a minimum of 3 years computer operations experience. Experience on CDC 6000 or Cyber hardware is desirable.

These are permanent positions with a growing corpoation, excellent benefits package and opportunity for advancement.

Interested persons should forward resume and salary history in confidence to Potomac Research Incorporated, P.O. Box 1101, West Station, Huntsville, Alabama 35807. Attn: Ted Foret.

PRI POTOMAC RESEARCH INCORPORATED
An Equal Opportunity Employer M/F

TOYOTA

SYSTEMS PROGRAMMERS

Toyota, the nation's number one automobile importer has immediate positions available for Systems Programmers in the following areas:

SYSTEMS PROGRAMMER TRAINEE

(2nd Shift)

With primary responsibility to provide technical and systems software support to data center personnel, and secondary responsibility to include work on assigned systems programming tasks including systems utilities maintenance, program products, etc. Previous operations interface experience desirable. BS degree in computer sciences plus one year experience utilizing IBM computers.

SENIOR SYSTEMS PROGRAMMER

To be responsible for senior level general systems support, software evaluation, measurement and installation, and JES 2. Position requires 7-8 years data processing experience (or 4 years with BS degree) including 3-4 years recent experience in IBM systems software. Toyota's current computer configuration includes an IBM 370/158AP using MVS 3 7, VTAM, TSO, IMS, and TASK MASTER. 3033 planned for January 1979.

We offer excellent salaries and outstanding benefits including medical, dental coverage and 21 paid holidays per year For immediate consideration please forward resume and salary requirements to:

JOHN R. FREEMAN

TOYOTA MOTOR SALES, U.S.A., INC.
2055 W 190th St , Torrance, Calif 90504
An Equal Opportunity Employer M/F

SYSTEMS ENGINEER

TELECOMMUNICATIONS

The Corporate Processing Center of INA Corporation has an immediate opening for a Senior Systems Engineer who will be part of the team to plan and implement the movement of data processing and a nationwide telecommunications network to the INA Corporate Processing Center. This will involve integrating a Honeywell-based system into an IBM environment which consists of 3 IBM 370/168's operating under MVS. The successful applicant will define and plan the required communications systems environment. Duties will include communication systems hardware/software planning, design, implementation and testing for both host and front end processors.

This position requires knowledge of IBM systems environment, especially teleprocessing applications (CICS, TCS), teleprocessing access methods (TCAM, VTAM) and communications controller hardware and software (emulator or network control program). Familiarity with communications hardware (common carrier offerings, modems, terminals, and front end processors) would be desirable.

Our modern data processing complex is located in suburban Southern New Jersey. Qualified individuals should submit resume stating salary required in confidence to:

INA CORPORATION

CORPORATE PROCESSING CENTER

Department J R
P.O. Box 36
Somerdale, N.J. 08083
Equal Opportunity Employer M/F

Application Programmers

San Francisco Peninsula

At ISS/Sperry Univac our continued success in the disk memory marketplace means personal and professional growth for our employees. Our expansion has created challenging opportunities for qualified programming professionals.

Your background should include up to 2 years of COBOL experience, with a degree preferred. Accounting background and experience with Univac equipment are highly desirable.

If you have the talents we are seeking, please send your resume to our Employment Office, 10435 North Tantau Avenue, Cupertino, CA 95014. An Equal Opportunity Employer M/F.

ISS

SPERRY UNIVAC

PROGRAMMER/ ANALYST

Well established manufacturing plant is expanding its data processing staff to keep pace with on-going industrial expansion and rapid corporate growth. Headquartered in Central Wisconsin, The Graber Company is a leader in the manufacture of window and drapery hardware.

Applicants for Programmer Analyst must have 1 or more years of COBOL experience in a manufacturing environment and at least an associate degree. Additional training and IBM experience are highly desirable. Submit resumes to:

THE GRABER COMPANY

Graber Plaza
Middleton, WI 53562
An Equal Opportunity Employer M/F

DATA BASE ANALYSTS PROGRAMMER ANALYSTS SYSTEMS DESIGNERS

BCS Richland, Inc., Richland, Washington (a subsidiary of The Boeing Company), is actively engaged in the development of "state-of-the-art" systems utilizing data base and on-line technology on dual UNIVAC 1100/44 computers.

DATA BASE ANALYSTS/DESIGNERS

Duties include analysis, design and development of data bases for both batch and on-line applications utilizing DMS1100 Data Base Management System. Other duties consist of training, consultation, performance measurement and optimization of data base designs.

Qualifications include 3 years applicable experience, preferably at least 1 of the 3 years experience with DMS 1100, S2000, or a CODASYL standard data base management system.

ON-LINE PROGRAMMER ANALYST

Duties include analyzing requirements, designing and developing on-line applications utilizing low and medium speed terminals, transaction processors and DBMS software.

Qualifications include 3 years analysis or programming experience. On-line systems experience utilizing S2000 or UNIVAC products such as TIP, QLP, CMS and DMS1100 is preferable.

TIP DESIGNER

Duties include reviewing on-line application requirements for applicability to Transaction Information Processing, providing consultation to applications development projects, and developing and updating transaction processing standards.

Qualifications include knowledge of TIP, telecommunications networks, terminal clusters and their capabilities, and data base concepts and data base design.

A degree in computer science, math, engineering, business administration or the equivalent experience is preferred in all positions.

BCS Richland, Inc. provides vital support services to the U.S. Department of Energy, Hanford Complex. The above development and design requirements will exist for at least five to ten years.

The Tri-Cities, Richland, Pasco and Kennewick, are well-known for a temperate climate, numerous recreational facilities, superb educational systems and excellent living conditions.

Submit your résumé to:

Ms. Judith C. Peck
BCS Richland, Inc.
P.O. Box 300-L
Fed. Bldg., Room 149
Richland, WA 99352

An equal opportunity employer M/F.

BCS Richland, Inc.
A SUBSIDIARY OF THE BOEING COMPANY

COMPUTER SCIENCE

Faculty position to teach undergraduate computer science with primary responsibility for computer hardware courses. PhD in computer science or electrical engineering required. Send resume to Chairman, Department of Mathematics and Computer Science, University of Arkansas at Little Rock, Little Rock, Arkansas 72204, an Affirmative Action employer.

SYSTEMS ANALYST

We're small but growing, and we have a great opportunity for Someone with 2-3 years' experience in systems analysis plus life insurance background to grow along with us.

If you think you're that Someone, send us your resume.

Covenant Life
Insurance Company
69 Woodland St.
Hartford, CT 06101
Attn: P. Pastuszak
An Equal Opportunity Employer

URGENT OHIO

Openings in our locale for Data Processing programmers, system programmers and analysts, consultants and mini-computer software and hardware people.

Fee paid opportunities in MIS, Research, Terminal support and DEC hardware with nationally known companies in East Central Ohio.

We have 20 years DP experience with National affiliations. Send Resume to: Blair Personnel, DP Division, 102 Central Plaza No., Suite 104, Canton, Ohio 44702

The ROMAC DIFFERENCE

Confidential

Some firms take an applicant's resume and send it in many directions. Romac believes that the qualified professional prefers us to treat his resume in a more confidential manner. That's why we always present it on an individual basis. We don't use the "laundry list" technique because it really doesn't help anyone. That's a Romac difference and another reason top professionals in EDP come to us.

Talk to us about many great career opportunities like these representative positions.

DP Senior Systems Consultant (Nashville area)	Atlanta $25,000
Technical Support Manager (New Bedford area)	Rhode Island $32,000
Financial Analyst	Portland $23,000
Programmer/Analysts	Stamford $25,000
Software Programmer	Wellesley Hills $25,000
Senior Programmer	Charlotte $15,000

ROMAC & ASSOCIATES
Personnel Consultants

Contact your local Romac office in Atlanta, Boston, Buffalo, Charlotte, Hartford, New Haven, Philadelphia, Portland, Rhode Island, Rochester/Syracuse, Stamford, Wellesley Hills or write A. L. Lemay, President, 2 Sun Life Executive Park, Wellesley Hills, MA 02181

EDP SPECIALISTS

Connecticut Location

Citytrust, a major commercial bank in Southwestern Connecticut with a Computer Center in an attractive suburban location, has immediate openings for qualified EDP specialists. These positions offer excellent benefits and career growth opportunities

- **SR. PROGRAMMER/ANALYST**
  3-5 Years Experience To $22K
- **PROGRAMMER/ANALYST**
  2-3 Years Experience To $20K
  - ☐ Must be strong in COBOL or BAL, conversant with OS/VS and JCL
  - ☐ Financial application a definite plus
  - ☐ College graduate technical school graduate, or equivalent work experience
- **SYSTEMS PROGRAMMER**
  2-4 Years Experience To $22K
  - ☐ Ideal candidate will be familiar with large scale IBM VS/1 installation (Twin 158's)
  - ☐ First assignment will be to plan and install CICS, VTAM and MCP using 3705 front-ends to totally automate the bank using on-line IBM 3600 Financial Terminals (200 work stations)
  - ☐ Will be responsible for the generation, maintenance and enhancement of our systems software, act as vendor interface to resolve problems and technically support a very competent DP staff

Interested applicants should write

Citytrust

A. WALTER ESDAILE
20 Nutmeg Drive
Trumbull, CT 06611
203-384-5395

Equal Opportunity Employer M/F/Hdcp

NIKE

ATHLETIC SHOES

- Beating the Competition is relatively easy, but beating yourself is a never ending commitment.
- We need people who share our commitment to innovation and excellence.
- We seek a special systems analyst for our Maine location.
  - Mini-computer experience necessary
  - Prefer time share mode
  - Prefer 4-5 years experience developing manufacturing applications

Please Send Resume To David Kottkamp
NIKE
8285 S.W. Nimbus
Suite 115
Beaverton, OR 97005

SENIOR DP MANAGEMENT CONSULTANT

Nolan, Norton & Company is a rapidly expanding Boston area consulting firm specializing in management of large data processing organizations. We are seeking several senior management consultants with a combination of administrative and data processing backgrounds. You will have the opportunity to work with the senior management of Fortune 500 companies in addressing top-management issues relative to data processing. Successful candidates will have strong analytical and conceptual skills plus an ability to communicate at the senior management level. An MBA or CPA is highly desirable. Starting salaries from $20,000 to $30,000 plus performance bonus opportunity. Send resume to:

Richard L. Nolan, Chairman
Nolan, Norton & Company, Inc.
One Militia Drive
Lexington, MA 02173
An equal opportunity employer.

ST. Staff Programmer
Sr. Design Engineer

L.I., New York based client needs unusually competent professionals for analytical programming and systems analysis group which accepts, tests and then operates on-line real-time electronic fund transfer network system.

The Sr. Staff Programmer should know Assembly language, preferably on minicomputers, CRT and disk.

The Sr. Design Engineer will represent field engineering and make decisions to improve design of network hardware, and do in-depth analysis of hardware design to uncover deficiencies that might lead to performance problems and design changes.

Excellent starting salaries and benefits. Please write CW Box 1688, 797 Washington St., Newton, MA 02160.

ASSISTANT DIRECTOR FOR SYSTEMS DEVELOPMENT

Work involves providing leadership, coordination, and control of data processing systems design and programming services for a major division of a leading educational service organization.

Candidates should have a degree in business or computer science, with experience in designing and implementing business systems and knowledge of COBOL and IBM 360/370 OS JCL. Candidates should also possess excellent leadership and supervisory skills.

Starting salary in the $19,000 - $22,000 range with excellent retirement and insurance benefits.

Send resume and salary history to Personnel Services
The American College Testing Program (ACT), Box 168, Iowa City, IA 52240 *ACT is an Equal Opportunity Employer M/F.*

SOFTWARE SUPERVISOR

We are searching for a degreed software engineering supervisor experienced in R/T system software design, and able to plan, organize, schedule, budget and track supervision to s/w analysts and programmers. Experience in minis, micros, and process control desired. Major company in suburban New Jersey with an excellent compensation and benefit package. Please send detailed resume and advise of current salary.

CW Box 1690
797 Washington St.
Newton, Ma. 02160

P D P 11
RSTS/E

Small university computer center seeks responsible individual for a variety of tasks in operations and programming. Stimulating work environment in an Academic setting and a Vermont lifestyle to match. Primary function to support Administrative operations. POISE DMS system in use. Basic-PLUS, Fortran, college work experience desirable. Send resume to: Howard N' Goldsmith, Computer Center, Norwich University, Northfield, VT 05663

MARKET AND PRODUCT PLANNER

Colorado

Storage Technology Corporation is a recognized industry leader in high technology tape and disk drives and related data storage system products.

Our growth the past 9 years has been phenomenal. Continued rapid expansion has created several outstanding career opportunities for experienced professionals with proven planning and marketing background.

You will define product requirements for new products based on an analysis of customer needs, the current product line, and competitive trends. You will identify new market opportunities, develop and implement market and product plans.

You will also evaluate product proposals for technical and marketing content.

You should have a minimum of 8 years experience in the data processing industry in planning, marketing and/or systems engineering. In addition, technical experience with IBM 370 software is highly desirable.

We offer an excellent location in the Boulder, Colorado area. For the outdoor enthusiast, access to the Rocky Mountains is a real plus. Skiing, camping, hiking, and fishing areas are only minutes away!

If you possess qualifications for this position, and are interested in a career potential with a strong growth company, send us your resume which we will review on a confidential basis. Call John McIntosh, TOLL FREE 1-800-525-2940. Ext. 6244.

STORAGE TECHNOLOGY CORPORATION
2270 South 88th Street
Louisville, Colorado 80027

STC

CALIFORNIA

- **ORANGE COUNTY**
  Major div. of a multi-billion dollar co. needs several Sr. P/A's to design and program new business applications. Any COBOL programming on large scale hardware acceptable. Excellent benefits and relocation package. Salary to $22,000.
- **SOUTH BAY**
  Large IBM 370 installation has multiple openings for degreed programming professionals. Desirable Coastal location. Salary to $22,000.
- **SAN FERNANDO VALLEY**
  Manufacturing firm seeks Sr. P/A's with 370 COBOL and/or BAL exp. Development team now being formed for data-based mfg. sys Salary to $21,000.
- **ORANGE COUNTY**
  Electronics firm needs two P/A's for their expanding D.P. staff. Requires 2 yrs. of 370/DOS COBOL exp. Salary to $19,000.

the jarvis walker group
11222 S La Cienega Blvd., Inglewood, Ca 90304
(213) 670-7353

MANAGER, INFORMATION SYSTEMS

We are a rapidly growing producer of custom molded thermoset plastics supplying the electrical, power tool, and business machine OEM's. Corporate Headquarters and the Main Production Facility is located in Lafayette, Indiana, which provides a superior academic and cultural environment with a population of approximately 85,000.

We have an immediate opening for a manager, information systems. The ideal candidate will have both a financial/ administrative and manufacturing systems background with mixed hardware experience. Minimum degree requirement is a BS. Minimum of 8 years EDP in a manufacturing environment required, at least 4 years of which is management related with progressing responsibilities. This individual will report directly to the Director, Finance. Salary commensurate with experience plus excellent fringes. Please submit resume and salary history in complete confidence to:

Mr. D.L. Medved

ROSTONE CORPORATION

2450 Sagamore Pkwy. S.
Lafayette, IN 47902
An Equal Opportunity Employer M/F

Detach here, moisten and seal envelope securely before mailing.

Fold and insert order form (attached through binding) and remittance here.

USE THE ATTACHED ORDER FORM AND THIS ENVELOPE FOR:

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new industry

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COMPUTERWORLD
797 Washington Street
Newton MA 02160

EDP CONSULTANTS

The Management Services Group of a Big 8 CPA Firm desires to hire outstanding EDP professionals to fill consultant and management positions in its Detroit office.

To qualify you should have a minimum of 3 years experience in the development and implementation of large-scale information systems. Hands-on experience with data base and on-line systems a plus.

These positions offer the challenge of consulting work with excellent advancement opportunities. Compensation commensurate with ability and experience, includes excellent fringe benefits. Limited travel.

Send detailed resume with salary history, in confidence, to:

Mr. L.A. Viegas
Suite 3500
100 Renaissance Ctr.
Detroit, MI 48243
Equal Opportunity Employer M/F

PROGRAMMERS SYSTEMS ANALYSTS

Growing mid-size firm using state-of-the-art techniques. Advancement potential. Solid experience in either technical or business systems desired. We are looking for creative-adaptable thinkers and doers. $17K-26K plus super benefits. Send resumé, or call Fred Page

SELECTIVE RECRUITING ASSOCIATES
3001 S. State St.
Ann Arbor, MI 48104
Phone: (313) 994-5632 (collect)

ROSENGRENS

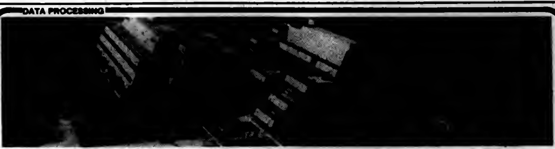
We are a leading Swedish manufacturer and are starting up commercial activities in the U.S.

We are looking for SALES REPRESENTATIVES to sell our fireproof cabinets to computer users. These cabinets protect tapes and discs from loss due to fire, moisture etc.

Territories in New England and Mid Atlantic open. Experience selling computer peripheral equipment, security products helpful.

Excellent potential. Send resume to **CW Box 1694, 797 Washington St., Newton, MA 02160.**

DATA PROCESSING



SYSTEMS ANALYSTS, PROGRAMMER ANALYSTS SYSTEMS PROGRAMMERS

BURROUGHS WELLCOME CO., a long-established manufacturer of drugs and pharmaceuticals, is seeking highly motivated, career-oriented data processing personnel.

SYSTEMS ANALYSTS

Responsibilities will include evaluation of user requirements for business systems in the areas of manufacturing and finance, development of systems architecture, and detailed systems specifications.

Requirements include a B.S. degree in Statistics, Mathematics, Accounting, Computer Science, or equivalent experience/training as an Analyst. Minimum of four years experience as a Systems Analyst in a Data Base environment for business systems, including COBOL or PL/I, is necessary. IMS exposure a definite plus.

PROGRAMMER ANALYSTS

Responsibilities will include application software development in an IMS Data Base environment, including program coding, test data generation, and implementation responsibilities.

Requirements include a B.S. degree in Computer Science or equivalent experience/training as an analyst, and a minimum of three years data processing experience in all aspects of programming, testing, and debugging programs in PL/I or COBOL. Must be able to prepare documentation for users and have good oral and written communication skills.

SYSTEMS PROGRAMMERS

Responsibilities will include defining and programming moderately complex software such as utility programs, catalogued procedures (job control language), macros and subroutines. Will assist in or be responsible for complex software installations such as system control program generation.

Requirement include a B.S. degree in Computer Science or equivalent experience/training as a Systems Programmer and a minimum of one year experience with OS/VS1 or OS/VS2 software in systems programming or applications maintenance programming. Working knowledge of macro assembler language programming and good oral and written communication skills are also necessary. MVS experience a definite plus.

BURROUGHS WELLCOME CO. facilities are located in the beautiful Research Triangle Park area of North Carolina. The Triangle Park area, surrounded by Durham, Raleigh, and Chapel Hill, provides not only superior living and recreational opportunities, but also moderate winters, pollution and smog-free summers, and a reasonable cost of living.

BURROUGHS WELLCOME CO. offers a comprehensive, company-paid benefit package including family medical insurance, employee life insurance, sick leave, and pension program. In addition, these positions offer excellent growth potential, competitive salaries commensurate with experience/training, and a generous relocation allowance.

Systems Analysts, Programmer Analysts and Systems Programmers who meet the job requirements and are interested in joining an innovative, dynamic organization should send a resume detailing education, training, work history, D.P. equipment and language experience, and salary requirements to: Employment Supervisor, **BURROUGHS WELLCOME CO.**, 3030 Cornwallis Road, Research Triangle Park, N.C. 27709.

If you do not have an up-to-date resume readily available, call Clyde Rush, COLLECT (919) 549-8371, Ext. 292 to apply.

All Replies Held in Confidence — All Replies Will Be Acknowledged

Wellcome

BURROUGHS WELLCOME CO.
An Equal Opportunity Employer M/F
MINORITY, VETERAN, HANDICAPPED INDIVIDUALS ARE ENCOURAGED TO APPLY

---

system analyst/ programmers

FMC Corporation, a 2 billion dollar corporation, has immediate openings in Management Information Services at its Philadelphia Drive Division. The Drive Division is a leading manufacturer of power transmission equipment. The successful candidate will have two or more years of system design and programming (ANS, COBOL, ALC) experience in the following areas: MRP, master scheduling, shop floor control, order entry. Also, experience with large-scale IBM 370 using OS/MVS and JES 2 required. CINCOM/TOTAL data base software and TSO experience strongly preferred.

We offer excellent salary, benefits and opportunity for personal and professional growth. Please send resume in confidence to Employee Relations Department, FMC Corporation, Drive Division, 2045 W. Hunting Park Avenue, Philadelphia, PA 19140. Equal Opportunity Employer M/F

FMC

Computer Professionals:

CICS PROGRAMMERS

BLUE BELL, INC., a Fortune 500 apparel manufacturer headquartered in Greensboro, N.C., is seeking experienced CICS Programmers due to expansion. Last years sales of such trade names as Wrangler, Red Cap, Maverick and Sedgefield were more than $873 million.

An applicant must have a minimum of 2 yrs. heavy programming experience with CICS in order to program difficult on-line applications.

Please send resume including salary history and requirements in strictest confidence to

Manager, Management Recruitment

BLUE BELL, INC.
P.O. Box 21488
Greensboro, N.C. 27420

An Equal Opportunity Employer

DATA PROCESSING MANAGER

Opportunity for a take-charge person to direct the City's computer programming and data processing operations. Duties include supervising a staff of 6 employees, controlling project development from initial study through implementation and conducting feasibility studies.

Graduation from an institute of higher learning in data processing or a closely related field and seven years' experience are required.

Beginning salary up to $19,656 annually depending upon experience, plus comprehensive City-paid benefits. Apply to:

City of Sheboygan-City Hall
Personnel Office, Rm. 204
828 Center Avenue
Sheboygan, WI 53081

DATA COMMUNICATIONS PROFESSIONALS

The United States Senate requires senior data communications system professional for development and enhancement of its data communications network and technical control facility. Ten years data communications experience and Bachelor's degree desired. Masters degree preferred. Candidate should have working knowledge of tariffs & data services, communications processors, technical control equipment, terminals, and other data communication equipment. *Salary negotiable. Send resume with salary history to:*

Network Manager
U.S. Senate Computer Center
Dirksen Senate Office Building,
Washington, D.C. 20510.

SYSTEMS PROGRAMMER

Well known banking institution. 2+ yrs. systems programming (Assembler) with DOS & OS exp. Any CICS exp is a plus. Dual 370/145 converting to dual 3032. Exclnt potential. $24K. Fee paid.

ROBERT HALF
PERSONNEL AGENCIES, INC.
522 Fifth Avenue
New York, N.Y. 10036
(212) 221-6500

MARKETING SYSTEMS ENGINEER

We are a $30-million++ manufacturer of computer terminals and data communications products. If you are looking for a challenge and growth opportunity we would like to hear from you.

Eastern region position to provide sales support. Required to achieve interface between printing terminals, CRT's and front-end processors or host computer facilities in a time-sharing environment.

This individual will report to the Eastern Region Sales Manager and work with sales in support of sales activities related to data communication and message switching application.

Must be knowledgeable of operating systems software used for large scale or mini-computer on-line systems. Must be familiar with Control Programs. Polling and Queueing Monitors and Data Communications protocol. Minimum of 5 years' experience is required along with a bachelor's degree in technical discipline.

Anderson Jacobson offers a complete benefits package and opportunities for career advancement. Please send your resume, in confidence, to: Richard J. Hertel, Eastern Region Sales Manager,

ANDERSON JACOBSON, INC.
80 Fredericks Street
Hackensack, N.J. 07601
An Equal Opportunity Employer M/F

Sr. Systems Analysts

Hammermill Paper Company is expanding its MIS Department and provides solid opportunities for DP pros to expand skills through a wide range of industrial applications. Running with state-of-the-art software, we have the tools, the setting and the goals to facilitate your reach for high achievement.

As a project leader and designer of financial/accounting systems in an industrial environment, you must have 2-4 years experience in designing and implementing financial reporting systems.

Preferred candidate will have COBOL programming background and a knowledge of systems design methodology and project control techniques. Experience with IBM 370 OS/VS, CICS and DL-1 helpful.

Starting salary is excellent, plus full ranging benefits to include generous relocation assistance. Corporate headquarters position is located in pleasant lakeside community which combines major metropolitan attractions with the warmth, friendliness and low pressure of a small hometown. For immediate consideration, send resume with salary history to:

J.L. Heimbold, Jr.
HAMMERMILL
PAPER COMPANY
Box 1440, Erie, PA 16533

An equal opportunity employer M/F

DATA PROCESSING PROFESSIONALS

The J.E. Sirrine Company, recently rated the nation's leading industrial, architectural and engineering design firm, is developing an

INTEGRATED FINANCIAL/PROJECT MANAGEMENT SYSTEM

Our steady growth has created the following openings:

PROGRAMMER/ ANALYSTS

ANS COBOL, CODASYL Data Base Management Systems, Budgeting, Project Scheduling experience highly desirable.

OPERATIONS MANAGER

Responsibility over Production Scheduling, Data Entry, Data Collection, Communications, Users Interface.

These positions provide an excellent salary, outstanding benefits, solid career advancement opportunities and professional growth. Our Corporate Data Center is located in Greenville, South Carolina with remote sites in Houston, Texas and Raleigh, North Carolina.

Send resume, in confidence, to:
Personnel Director

J.E. SIRRINE COMPANY

Post Office Box 5456
Greenville, S.C. 29606

An Equal Opportunity Employer M/F

DATA PROCESSING CAREERS

Personnel Consultants

DALLAS

IBM S/3-34 Mgr. Prog. nat'l assn. D.P. Dept. unlimited — $20-25K

D.P. Mgr., E Texas, minimum 5 yrs exper wholesale grocery. Salary to — $25K

Suite 1109, Stemmons Tower W.
Dallas, TX 75207, (214) 637-6360

FT. WORTH

Systems Programmer
2 years experience
IMS, OS/MVS, JES $28k

Data Base Administrator
IMS, Oil Industry
D/FW Metroplex $35k+

Suite 911, One Summit Ave
Ft Worth, TX 76102, (817)336-4565

HOUSTON

If you can move yourself to Houston, we can find you a job.

CALL US!

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Houston, TX 77027, (713)960-9102

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EDP Consult Financial, degree	to $28k
Proj Leader Inventory Mgt	to $28ks,
Sys Prog MVS, TSO	to $23k
Sys Prog UNIVAC, degree	to $22K

6405 Metcalf Shawnee Mission,
Kansas 66202 (913) 236-8288

TULSA

Oil/Gas P/A	$25k
Sys Prog, MVS	$28k
Sys Prog, IMS	$25k
Banking, ACH	$18k
COBOL P/A, DOS	$18k
EDP Consult	$25k
Mfg Sys, Mini's	$24k
RPG, On-Line Exp	$19k
Mini Soft, PL/1	$20k

2624 E 21st St Tulsa OK 74114
(918) 747-3621

PROGRAMMERS
PROGRAMMERS/ANALYSTS

Excellent sun-belt opportunity in an IBM 370/158 OS/MVS environment

First Alabama Bancshares, a major regional multi-bank holding company is currently converting to an IBM 370/158 OS/MVS environment. To meet the requirements of this new program, we are seeking ambitious, talented individuals eager to seize a ground-floor opportunity for their career growth. We are located in a relaxed, pleasant Southern city with easy driving access to Atlanta, New Orleans, and the Florida Gulf Coast.

PROGRAMMER

Requires an individual with at least 1 year of experience in programming IBM Assembler or COBOL. A background in banking applications is desirable.

PROGRAMMER/ANALYST

Requires an individual with at least 2 years experience as a Programmer/Analyst in IBM OS Assembler or COBOL. You must have prior experience in banking applications.

We offer starting salaries in the mid to upper teens - commensurate with your experience. Our generous benefits program includes a retirement plan, a profit sharing program, life and health insurance, stock purchase plans, and more. Join us for a rewarding opportunity.

For immediate attention, send resume and salary history in complete confidence to:

First Alabama Bancshares, Inc.

W.H. Ross
Corporate Personnel Officer
P.O. Box 1448
Montgomery, AL 36102

An Equal Opportunity Employer M/F

MB MILTON BRADLEY

PROGRAMMER ANALYSTS

Are You Lost in the Crowd?

Become part of a small, dynamic computer group that has installed some of the most advanced on-line software in industry today. You will be exposed to all phases of a business that has made a major commitment to modern computer systems.

2 or more years experience in COBOL programming required with CICS experience a definite plus. We are currently utilizing a 370/158 with VM, CMS, DOS/VS, and CICS. The network includes over 100 terminals in 8 facilities in 4 states.

Excellent starting salary, insurance, tuition refund program, and other benefits. Please forward resume to:

STANLEY R. SHAW JR. C.A.M.

MILTON BRADLEY COMPANY

443 Shaker Road
East Longmeadow, Mass. 01028

An equal opportunity employer M/F

EDP AUDITORS

Ins & mfg clients expanding audit staffs. Individuals w/DP background & desire to develop new careers reviewing total systems integrity qualify for multiple openings. Very visible & promotable positions with occasional travel. Salaries to $28,000. Contact Stan Durbas or Paul Maisaner.

ROBERT HALF
PERSONNEL AGENCIES

111 Pearl St.
Hartford, Conn. 06103
(203) 278-7170

South Carolina

PROGRAMMERS ANALYSTS

Outstanding opportunity to become part of a growing staff with many chances for advancement, a true challenge and commensurate rewards. Salaries range from $10,000 to $25,000 depending on experience. COBOL or ASSEMBLER experience required. All relocation and fees paid by company. Call or send resume to:

Windy Smith, CEC
EXECUTIVE REGISTRY
PERSONNEL CONSULTANTS
Box J 778
Columbia, S.C. 29201
(803) 779-2197

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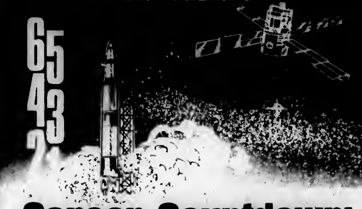

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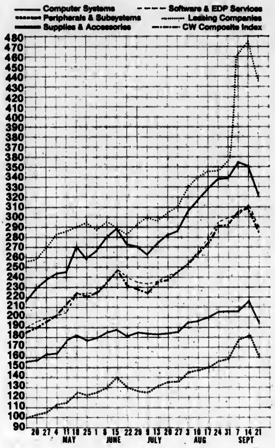

Earnings Reports

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Three Months Ended June 30

	1978	a1977
Shr Ernd	.....	$.19
Revenue	$4,094,702	9,971,464
Earnings	(232,161)	210,936
6 Mo Shr	.....	.63
Revenue	12,309,836	13,990,456
Earnings	(2,036,226)	612,939

a-Restated.

COMPUGRAPHIC
Three Months Ended July 2

	1978	1977
aShr Ernd	$.82	$.53
Revenue	49,273,000	34,177,000
Earnings	3,967,000	2,477,000
a9 Mo Shr	2.09	1.56
Revenue	133,871,000	95,125,000
Earnings	9,983,000	7,134,000

a-Adjusted to reflect two-for-one split paid in June 1978.

FOUR-PHASE SYSTEMS
Three Months Ended June 30

	1978	1977
Shr Ernd	$.63	$.62
Revenue	33,559,000	21,014,000
Tax Cred	.....	782,000
Earnings	2,866,000	2,910,000
Shr Ernd	1.24	1.20
Revenue	62,999,000	39,812,000
Tax Cred	.....	1,527,000
Earnings	5,448,000	4,844,000

INFOREX
Three Months Ended June 30

	1978	1977
Shr Ernd	$.19	$.17
Revenue	17,407,000	15,824,000
Tax Cred	91,000	77,000
Earnings	598,000	512,000
6 Mo Shr	.34	.32
Revenue	32,966,000	30,030,000
Tax Cred	143,000	156,000
Earnings	1,072,000	940,000

TELENET
Three Months Ended June 30

	1978	1977
Revenue	$2,168,000	$886,000
Loss	1,277,000	975,000
6 Mo Revenue	3,648,000	1,581,000
Loss	2,384,000	1,935,000

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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 20, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

EXCH		PRICE 1978 RANGE (1)	CLOSE SEP 20 1978	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	28- 69	57 3/8	-4 3/4	-7.6
M	BURROUGHS CORP	59- 87	77 5/8	-7 1/4	-8.5
O	COMPUTER AUTOMATION	23- 44	32 3/4	-2 1/2	-7.0
M	CONTROL DATA CORP	23- 44	36 3/4	-7 5/8	-18.7
O	CRAY RESEARCH INC	21- 74	60	-2	-3.2
N	DATA GENERAL CORP	42- 71	64 1/2	-4 1/2	-6.5
M	DATAPOINT CORP	34- 75	66	-7 1/2	-10.2
N	DIGITAL EQUIPMENT	39- 54	49 1/8	-4	-7.5
N	ELECTRONIC ASSOC.	2- 13	8 3/4	-2 1/8	-19.5
A	ELECTRONIC ENGINEER.	11- 19	13 5/8	- 3/4	-5.2
O	FOUR-PHASE SYSTEMS	19- 46	37 3/4	-8 1/4	-17.9
N	FOXBORO	28- 40	36 1/2	-1 1/2	-3.9
O	GENERAL AUTOMATION	7- 26	18 1/4	-5 1/4	-22.3
O	GRI COMPUTER CORP	1- 2	1 5/4	+ 1/4	+18.6
M	HEWLETT-PACKARD CO	62- 93	87 1/8	-4 5/8	-4.7
N	HONEYWELL INC	43- 72	65 1/4	-8 3/4	-9.3
N	IBM	236-305	284 1/2	-16 3/8	-5.4
O	MANAGEMENT ASSIST	9- 29	22 1/2	-3	-11.7
O	MICRODATA CORP	10- 23	19 1/2	-2 3/8	-10.8
O	MINI-COMPUTER SYST	5- 8	7 7/8	+ 7/8	+12.5
O	MODULAR COMPUTER SYS	7- 17	14 3/4	-1 3/4	-10.6
M	NCR	37- 87	82 1/2	-4 1/4	-6.3
M	PRIME COMPUTER INC	20- 43	33 5/8	-7 1/8	-17.4
M	PERKIN-ELMER	17- 28	25 1/8	-2 5/8	-9.4
M	RAYTHEON CO	29- 58	48 1/2	-4 1/2	-8.4
M	SPERRY RAND	33- 49	45 5/8	-2 1/4	-4.6
A	SYSTEMS ENG. LABS	11- 24	17 1/8	-2 1/4	-11.6
A	WANG LABS.	12- 32	25 5/8	-4 1/2	-14.9
	LEASING COMPANIES				
O	BOOTHE COURIER CORP	13- 20	19 1/4	-1 1/4	-4.0
O	COMDISCO INC	5- 19	17 1/4	-2	-10.5
A	COMMERCE GROUP CORP	1- 1	5/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	4 7/8	- 5/8	-11.3
M	DATRONIC RENTAL	1- 2	1 7/8	+ 1/4	+15.3
A	DCL INC	3- 5	4 1/2	0	0.0
N	DPF INC	8- 14	11	-1 1/2	-12.0
N	ITEL	10- 56	33 1/2	-5 5/8	-14.9
N	LEASCO CORP	24- 36	30 3/4	-2 5/8	-7.1
C	LEASPAC CORP	1- 4	2 1/2	- 3/8	-13.0
A	PIONEER TEP CORP	5- 7	4 5/8	-1 3/8	-22.9
N	U.S. LEASING	13- 20	17 5/8	-2	-10.1
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 5/8	0	0.0
O	ANACOMP INC	8- 22	15 1/4	-2 1/4	-12.8
A	APPLIED DATA RES.	8- 17	15 3/8	- 1/2	-3.1
M	AUTOMATIC DATA PROC	24- 36	30 3/4	-2 1/2	-7.5
P	COLEMAN AMERICAN COS	1- 2	1 7/8	0	0.0
O	COMPU-SERV NETWORK	7- 12	8	0	0.0
O	COMPUTER HORIZONS	1- 9	8 1/4	-1	-10.8
O	COMPUTER NETWORK	8- 16	11 3/4	-2 7/8	-19.6
M	COMPUTER SCIENCES	8- 17	13 1/2	-1 3/4	-11.4
O	COMPUTER TASK GROUP	1- 4	3 1/4	0	0.0
O	COMPUTER USAGE	2- 4	3 1/2	- 3/4	-17.6
O	COMSHARE	6- 19	17 1/2	-1 3/4	-9.0
O	DATA DIMENSIONS INC	4- 9	8	+ 3/8	+4.9
O	DATATAB	1- 2	1 1/4	0	0.0
N	ELECTRONIC DATA SYS.	15- 25	22 5/8	-1 1/8	-4.7
O	INSYTE CORP	1- 3	1 3/4	- 7/8	-33.3
O	IPS COMPUTER MARKET.	2- 3	3 1/4	0	0.0
O	KEANE ASSOCIATES	3- 6	6	0	0.0
O	KEYDATA CORP.	1- 3	2	- 1/8	-5.8
A	LOGICON	11- 19	17	-1 3/4	-9.3
A	MANAGEMENT DATA	1- 1	7/8	0	0.0
A	NATIONAL CSS INC	15- 36	29 3/4	-4 1/4	-12.5
O	NATIONAL DATA CORP	7- 13	11 1/2	-1 1/4	-9.8
A	ON LINE SYSTEMS INC	17- 30	26 7/8	-1 3/4	-6.1
N	PLANNING RESEARCH	4- 10	8 5/8	-1 3/8	-13.7
O	PROGRAMMING & SYS	1- 1	1 1/4	+ 1/4	+25.0
O	RAPIDATA INC	3- 7	6 1/8	- 5/8	-9.2
O	REYNOLDS & REYNOLD	18- 36	30	-2 1/4	-8.9
O	SCIENTIFIC COMPUTERS	3- 9	8 3/8	- 1/2	-5.6
O	TYMSHARE INC	18- 53	29 7/8	-3 1/4	-9.8
A	URS SYSTEMS	5- 8	6 3/4	- 5/8	-8.4
M	WYLY CORP	1- 7	6 1/4	-1 1/8	-15.2
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	14- 32	26 3/4	-4 3/8	-14.0
O	ADVANCED MEMORY SYS	7- 18	16 1/2	-1 3/4	-9.5
N	AMPEX CORP	10- 19	16 1/4	-2 5/8	-13.9
O	ANDERSON JACOBSON	5- 10	7 7/8	-1 5/8	-14.8
N	APPLIED DIG DATA SYS	13- 22	15 5/8	-3 1/8	-16.6
C	BEEHIVE INT'L	4- 7	6 3/8	- 3/4	-10.5
A	BOLT,BERANEK & NEW	6- 14	12 3/4	+1 3/4	+15.9
N	BUNKER-RAMO	10- 20	17 1/4	-1 3/4	-9.2
A	CALCOMP	3- 13	10 1/2	-2	-16.0
O	CAMBRIDGE MEMORIES	3- 9	6 3/4	- 7/8	-11.4
M	CENTRONICS DATA COMP	16- 34	32 3/4	+1	+3.1
O	COGNITRONICS	1- 4	2	- 1/2	-20.0
O	COMPUTER COMMUN.	6- 12	11	-1 5/8	-13.9
O	COMPUTER CONSOLES	4- 10	8 1/4	- 3/4	-8.3
A	COMPUTER EQUIPMENT	3- 4	5 5/8	- 1/4	-4.4
O	COMPUTER TRANSCEIVER	1- 3	3 1/8	+ 5/8	+25.0
O	CONTEN	9- 38	31	-5 1/2	-15.0
N	CONRAC CORP	19- 26	22	- 3/4	-3.2
O	DATA ACCESS SYSTEMS	3- 14	12	- 1/2	-4.0
O	DATA 100	9- 20	19 1/4	0	0.0
A	DATA PRODUCTS CORP	15- 25	19 5/8	-4	-16.9
O	DATUM INC	2- 4	4 3/4	- 5/8	-11.6
O	DECISION DATA COMPUT	2- 4	4 3/8	- 5/8	-12.5
O	DELTA DATA SYSTEMS	1- 1	5/8	- 1/8	-16.8
A	DOCUMATION INC	6- 34	29 5/8	-1	-3.2
O	DATARAM CORP	8- 31	25 1/2	-5	-18.3
M	ELECTRONIC M & M	4- 9	6 3/4	-1	-12.9
O	FABRI-TEK	1- 2	1 1/2	- 3/8	-20.0
O	GENERAL COMPUTER SYS	1- 3	2 5/8	+ 3/8	+18.7
N	HAZELTINE CORP	10- 17	15 1/4	-1 1/4	-7.5
M	HARRIS CORP	40- 72	67 1/8	-4 7/8	-6.7
O	INFOREX INC	6- 11	9 3/4	-1 1/4	-11.3
O	INFORMATION INTL INC	8- 12	9 3/4	- 3/4	-7.1
O	INTEL CORP	39- 62	53 1/2	-6 1/2	-10.8
A	LUNDY ELECTRONICS	4- 8	6 7/8	-1 1/8	-14.0
O	MSI DATA CORP	12- 19	16 1/8	-1 1/8	-6.5
M	MEMOREX	27- 59	51	-8	-13.5
M	MOHAWK DATA SCI	6- 15	11 5/8	-2	-14.8
O	OMEX	2- 3	3 1/2	+1	+40.0
O	PENRIL CORP	5- 12	10	-1 3/8	-12.0
M	PERTEC CORP	9- 17	15	+ 1/8	+0.8
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 1/2	0	0.0
O	RECOGNITION EQUIP	7- 13	11 3/8	-1 3/8	-10.7
O	SCAN DATA	1- 5	3 1/2	- 1/4	-6.6
N	STORAGE TECHNOLOGY	19- 46	32 3/8	-4 7/8	-13.0
O	T BAR INC	11- 20	18 3/4	- 1/2	-2.5
O	TALLY CORP.	4- 9	7 3/4	+ 1/8	+1.6
A	TEC INC	6- 13	10 1/4	-1 3/4	-14.5
N	TEKTRONIX INC	33- 50	46 3/4	-1 1/2	-3.1
M	TELEX	3- 9	7 1/4	-1 3/8	-15.9
O	TESDATA SYSTEMS CP	13- 23	20	-3	-13.0
O	WILTEK INC	1- 1	7/8	0	0.0
	SUPPLIES & ACCESSORIES				
A	AMERICAN BUS PRODS	6- 11	9 7/8	- 3/4	-7.0
O	BALTIMORE BUS FORMS	2- 5	2 1/2	- 1/4	-9.0
A	BARRY WRIGHT	14- 30	25 3/4	-4 1/8	-13.8
O	CYBERMATICS INC	1- 1	1 1/4	0	0.0
O	DUPLEX PRODUCTS INC	18- 30	27 1/4	-2 1/4	-7.6
M	ENNIS BUS. FORMS	8- 17	14	- 7/8	-5.8
N	3M COMPANY	43- 66	60	-4 5/8	-6.7
O	MOORE CORP LTD	26- 34	30 1/4	-1	-3.1
N	NASHUA CORP	18- 37	30	-6	-16.6
O	STANDARD REGISTER	20- 27	24 1/4	-2	-7.6
A	TAB PRODUCTS CO	8- 14	14 1/4	-1 3/4	-10.9
M	UARCO	19- 28	25 1/8	-1 7/8	-6.9
A	WABASH MAGNETICS	10- 22	19	-2 1/2	-11.6
M	WALLACE BUS FORMS	18- 33	29	-4 1/4	-12.7

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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